

DR 500-1-1
CHANGE 1

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
210 TUCKER BOULEVARD, NORTH
ST. LOUIS, MISSOURI 63101-1986

LMSOD-E

Regulation
No. 500-1-1

15 June 1987


Emergency Management
NATURAL DISASTER RESPONSE PLANS

DR 500-1-1, 1 April 1986, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by an asterisk in the margin of the page at the beginning and end of the change.

<u>Remove pages</u> <u>DR 500-1-1</u>	<u>Insert pages</u> <u>DR 500-1-1</u>
2-1 thru 2-8	2-1 thru 2-8
3-5 and 3-6	3-5 and 3-6
3-8	3-8
4-1 thru 4-4	4-1 thru 4-4
5-1, 5-2, 5-10, 5-11	5-1, 5-2, 5-10, 5-11
5-14 thru 5-19, Section I, Engineering Guide, Section II, Maintenance Guide, and 5-24 and 5-25	5-14 thru 5-19, Section I, Engineering Guide, Section II, Maintenance Guide, and 5-24 and 5-25
A-3, A-4, A-7, A-8, A-11, A-12 thru A-18	A-3, A-4, A-7, A-8, A-11, A-12 thru A-18
C-1	C-1
E-1 thru E-3	E-1 thru E-3
H-1 and H-2	H-1 and H-2
I-1 thru I-12	I-1 thru I-12
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K-1 thru K-4	K-1 thru K-4

2. File this change in front of the publication for reference purposes.
3. Delete colored separator sheet for DIVR 500-1-1.


DANIEL M. WILSON
COL, CE
Commanding

DISTRIBUTION:
Special
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DR 500-1-1

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ST. LOUIS DISTRICT, CORPS OF ENGINEERS
210 TUCKER BLVD., NORTH
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1 April 1986

Emergency Employment Of Army And Other Resources
NATURAL DISASTER PROCEDURES UNDER PL 84-99 AND PL 93-288

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210 TUCKER BOULEVARD, NORTH
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Regulation
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1 April 1986

Emergency Employment of Army and Other Resources
NATURAL DISASTER PROCEDURES UNDER PL 84-99 AND PL 93-288

Chapter 1
INTRODUCTION

1-1. PURPOSE. The purpose of this plan is to provide supplemental data and local procedures for implementation of ER 500-1-1 in support of Emergency Flood Control. Procedures within the St. Louis District (SLD) are as follows:

a. Flood Control. These procedures include disaster preparedness, advance measures, flood fighting, rescue work and post disaster rehabilitation of flood control works damaged or destroyed by a flood.

b. Disaster Relief Act of 1974, PL 93-288. In support of the Federal Emergency Management Agency (FEMA), PL 93-288 encompasses conducting preliminary surveys/estimates of damages, furnishing recommendations and damage survey reports, and performing specific mission assignments requested by FEMA.

c. Other Projects. Emergency repair and restoration of Corps of Engineers Facilities necessitated by natural disasters except as covered by other directives of the Chief of Engineers.

1-2. APPLICABILITY. ER 500-1-1 is applicable to Corps of Engineers Divisions and Districts performing or supporting natural disaster assistance and recovery operations. The provisions of this District Regulation "DR 500-1-1, Natural Disaster Response Plan" are applicable to all St. Louis District, Field Offices and Floating Plant.

1-3. REFERENCES. Listed below are only a few references that govern Natural Disaster Procedures and are as follows:

- a. AR 500-60, Disaster Relief
- b. ER 10-1-3, Organizations and Functions
- c. ER 11-1-320, Army Programs
- d. ER 500-1-1, Natural Disaster Procedures

Other references are listed in Appendix A of ER 500-1-1.

This regulation supersedes DR 500-1-1, 1 April 1985

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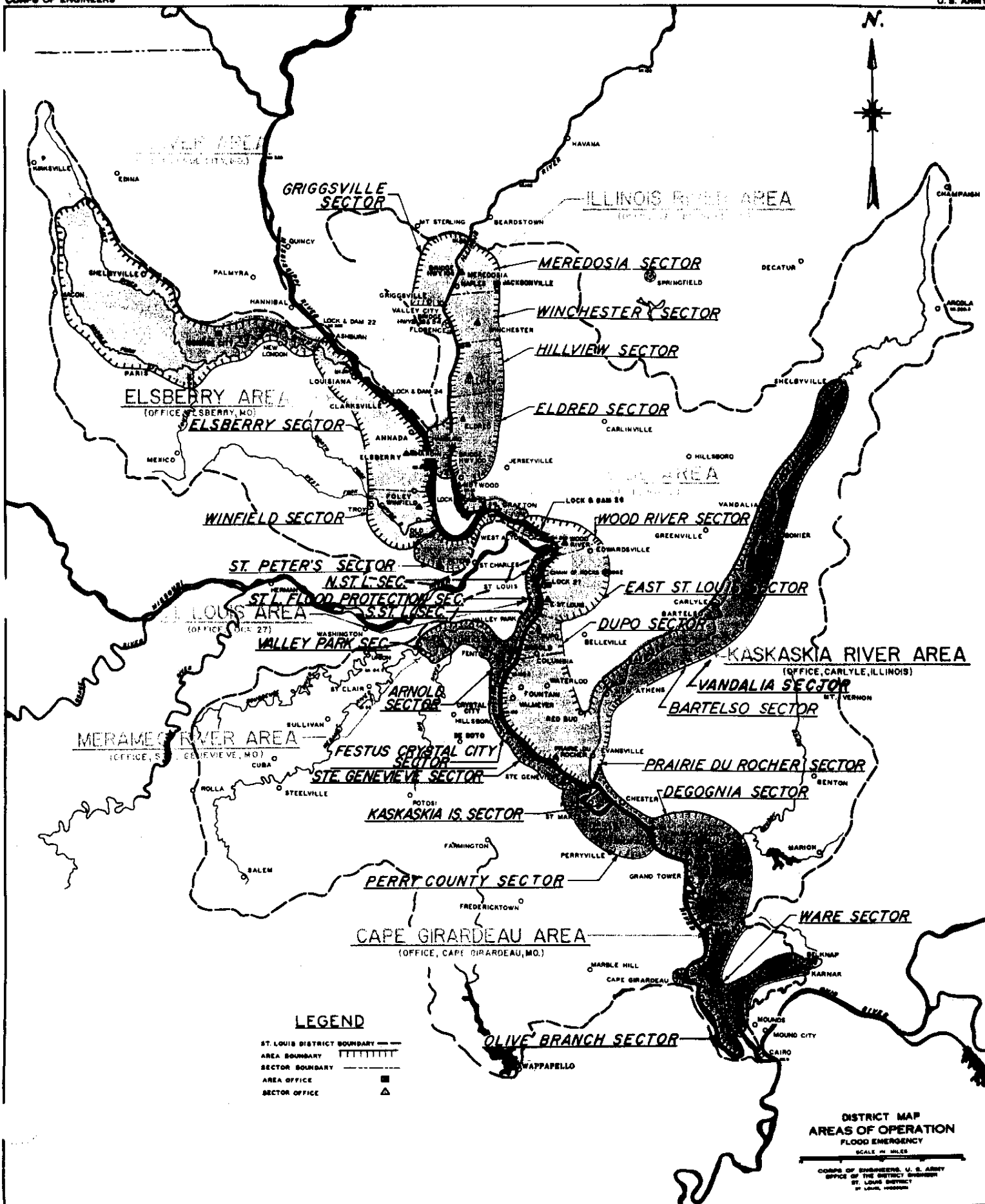
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1-4. IMPLEMENTATION. This plan will be used as the Natural Disaster Response Plan. Standard Operational Procedures (SOP's) required by Resident Offices, Project Offices, Lake Management Offices, Locks and Dams and Floating Plant will cover specific information not included in this plan.

1-5. PROCEDURES AND GUIDANCE. ER 500-1-1 prescribes the overall administrative policies, guidance and operating procedures for natural and technological disaster activities for the U.S. Army Corps of Engineers (USACE) and work for the Federal Emergency Management Agency (FEMA). This regulation is referred to throughout this plan and contains specific information in carrying out the intent of PL 84-99 and PL 93-288.

CORPS OF ENGINEERS

U.S. ARMY



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Chapter 2 DISASTER ASSISTANCE

2-1. GENERAL. The St. Louis District Commander is responsible for the overall accomplishment of authorized missions in accordance with the policies and guidance set forth in ER 500-1-1, (DIVR 500-1-1 and DIVR 500-1-2 (ECP) are regulations furnished by LMVCO-E). Responsibilities, duties, and functions prescribed in this plan will be executed through the St. Louis District Emergency Operations Center, District Staff and Flood Emergency Organization Personnel who are knowledgeable in the requirements, authorities, and needs within the St. Louis District.

2-2. DESCRIPTION OF FLOOD AREAS AND SECTORS OF OPERATION ARE AS FOLLOWS:

a. Salt River Flood Area (Office, Monroe City, MO)

Salt River Area extends from approximate river mile 150.0 (Salt River) downstream to approximate river mile 2.5 above the confluence of the Salt and Mississippi Rivers.

* Valley Drainage District and the Pike Grain Co. Private Levee are included in this area. *

b. Elsberry Flood Area (Office, Elsberry, MO)

Elsberry Area extends from Lock and Dam No. 22, approximate river mile 300, downstream along the right bank of the Mississippi River to river mile 233.5, the mouth of Peruque Creek:

Elsberry Sector

Elsberry Sector extends from Ashburn, Missouri, approximate river mile 293, downstream along the right bank of the Mississippi River to the lower limits of King's Lake, approximate river mile 246. Organized levee districts within this sector are: Elsberry, Kissinger, and King's Lake Drainage and Levee Districts. The private levees in this sector are: Pettus-Burns-Prewitt-Jaeger, Stone-Murdock, Clarksville Levee Association, Goose Pasture Farms, and the Annada Group. (The Annada Group includes: W.L. Wells, H. A. Wells, Omohundro, and Guin's Creek)

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Winfield Sector

Winfield Sector extends downstream along the right bank of the Mississippi River from river mile 246 to Peruque Creek, river mile 233.5. The levee districts within this sector are: Sandy Creek, Foley, Cap Au Gris, Winfield, and Brevator. The private levees within this sector are: Old Monroe, Schramm, Heitman, Portuchuck, and Marstan.

River Sector and Louisiana Sector (Mobile)

Lock and Dam No. 24 Sector Office

The river sector extends from Lock and Dam No. 22, river mile 300, downstream to the mouth of the Peruque Creek, river mile 233.5.

c. Illinois River Flood Area (Office, Jacksonville, IL)

Illinois River Area extends from river mile 80 (Illinois River) downstream to river mile 209.3, Mississippi River (Piasa Creek). This area is subdivided into sectors as described below:

Meredosia Sector

Meredosia Sector extends from river mile 80 downstream on the left bank to river mile 67. The Levee and Drainage Districts within this sector are: Willow Creek, New Pankey's Pond, Mud Creek, Indian Creek Drainage District No. 2 Cass and Morgan Counties, Meredosia Lake and Coon Run. Private levees within this sector are: Smith Lake and Oakes. This sector will also investigate and report flood conditions in Meredosia, Illinois, river mile 71.0 on the left bank of the Illinois River.

Griggsville Sector

Griggsville Sector extends from river mile 78.3 downstream on the right bank to river mile 66.5. The Drainage and Levee Districts within this Sector are: Valley City, Little Creek, and McGee Creek.

Winchester Sector

* Winchester Sector extends from river mile 66.5 downstream on the left bank of the Illinois River to river mile 50.1. The Drainage and Levee Districts within this sector are: Mauvais Terre, Scott County, and Big Swan. Private levees within this sector are: Walnut Creek and Robertson. This sector will investigate and report flood conditions in the vicinity of Villages of Bedford, river mile 48.5; Montezuma, river mile 50.1; and Florence, river mile 55.6 on the right bank of the Illinois River. *

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Hillview Sector

* Hillview Sector extends from river mile 50.1 on the left bank of the Illinois River downstream to river mile 38.0. The levee districts within this sector are: Hartwell and Hillview. Private levee is: Village of Pearl. This sector will investigate and report flood conditions in the vicinity of Kampsville, Illinois river mile 32 on the right bank of the Illinois River. *

Eldred Sector

Eldred Sector extends from river mile 38.2 downstream on the left bank of the Illinois River to river mile 15.2. The Levee and Drainage Districts within this sector are: Keach, Eldred, Spankey, Nutwood, and Macoupin Creek Drainage District. Private levees are: Farrow, Schaefer, and Levis and Robley. This sector will investigate and report flood conditions in the vicinity of Hardin, Illinois, river mile 21 on the right bank of the Illinois River and Grafton, Illinois, river mile 0.5 on the left bank. This sector also extends from approximate Mississippi River mile 251.0 to approximate river mile 209.3 (Piasa Creek). The private levees within this sector are: Star City, Etterfield, and the unprotected areas in this section.

d. East Side Flood Area (Office, Locks-27)

East St. Louis Area extends from river mile 209.3 (Piasa Creek) downstream along left bank of the Mississippi River to approximate river mile 118.

Also included are the unprotected and protected regions of the Kaskaskia River from approximate river mile 30 (mile 30 new mile = mile 42 old mile) to river mile 0. This area is subdivided into sectors as described below:

Wood River Sector

Wood River Sector includes Wood River levee downstream along the left bank of the Mississippi River from Alton, Illinois, to river mile 195.

Chouteau Island Sector

Chouteau Island Sector includes: Chouteau Island Drainage and Levee District, Chouteau, Nameoki, and Venice Drainage and Levee District, the Chain of Rocks Canal Levees, and Boesel Private Levee.

East St. Louis Sector

East St. Louis Sector extends from the south bank of Cahokia Creek, river mile 195, downstream along the left bank of the Mississippi River to Prairie du Pont Creek, river mile 175.

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Dupo Sector

Dupo Sector extends from Prairie du Pont Creek, river mile 175, downstream along the left bank of the Mississippi River to Fountain Creek, river mile 156. The Drainage and Levee Districts in this sector are: Prairie du Pont, Fish Lake, and Columbia.

Prairie du Rocher Sector

Prairie du Rocher Sector extends from Fountain Creek, river mile 156 downstream along the left bank of the Mississippi River to the Kaskaskia River, river mile 118. The Drainage and Levee Districts within this sector are: Harrisonville, Ft. Chartres and Ivy Landing, Stringtown, Prairie du Rocher and Modoc, Edgar Lake, and Schaefer Farms Private Levee. Also included in this sector is the Kaskaskia River from river mile 30 (mile 30 new mile = 42 old mile) to river mile 0 and Village of New Athens.

e. St. Louis Flood Area (Office, Illinois Resident Office)

St. Louis Area extends from approximate Mississippi River mile 233.5, (mouth of Peruque Creek) downstream along the right bank of the Mississippi River to approximate river mile 168.6 (Jefferson Barracks Bridge). This area is subdivided into sectors as described below:

St. Peters Sector

St. Peters Sector extends from Peruque Creek, river mile 233.5, downstream to mouth of the Missouri River and includes the St. Peters Drainage District. The private levees in this sector are: Dardenne Creek (East and West Flanks), Schroeder-Daudt, Schulte-McNeary-Schlenke, Daudt, Spencer Creek, Chris Machens, Boschert, Henry Machens, Neustadt-Farley, Brass-Brunstein, Grunwaldt, Kuhs, West Alton, Hollrah, and Ehlmann.

North St. Louis Sector

North St. Louis Sector extends from Mississippi River mile 195.0 to approximate river mile 187.5 and along river mile 0 to 5, Missouri River. Columbia Bottoms Private Levee and the unprotected areas along the right bank of the Mississippi River are within this sector.

St. Louis Flood Protection Section

St. Louis Flood Protection Sector extends from river mile 187.2 (mouth of Maline Creek) downstream to approximate river mile 176.3 (Chippewa Street), Mississippi River. St. Louis Flood Protection Project, Reaches 3 and 4, are in this sector.

*

*

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South St. Louis Sector

South St. Louis Sector extends from river mile 176.3 (Chippewa Street) on the right bank of the Mississippi River downstream to approximate river mile 168.6 (Jefferson Barracks Bridge) Mississippi River. Unprotected areas along the right bank of the Mississippi River, including River des Peres vicinity are included in this sector.

f. Meramec River Flood Area (Office, Ste. Genevieve, MO)

Meramec River Area extends from the Jefferson Barracks Bridge, approximate river mile 168.6 downstream along the right bank of the Mississippi River to approximate river mile 121.0, Mississippi River. This area is subdivided into sectors as described below:

Valley Park Sector

Valley Park Sector extends from Pacific, Missouri, downstream to Fenton, Missouri, along the Meramec River including all unprotected areas within this reach.

Arnold Sector

Arnold Sector encompasses the unprotected areas from approximate Mississippi River mile 168.7 downstream to approximate river mile 157.0 and along the Meramec River from the confluence with the Mississippi River to Fenton, Missouri.

Festus-Crystal City Sector

Festus-Crystal City Sector extends from approximate river mile 157.0 downstream to approximate river mile 146.5. The Pittsburgh Plate Glass Company Private Levee and the unprotected area along the right bank of the Mississippi River are within this reach.

Ste. Genevieve Sector

Ste. Genevieve Sector Office extends from river mile 146.5 downstream to approximate river mile 121.0 and encompasses the unprotected areas along the right bank of the Mississippi River.

g. Kaskaskia River Flood Area (Office, Carlyle, IL)

* Kaskaskia River Area extends from river mile 222 to river mile 30 (mile 30 new mile = mile 42 old mile) along the Kaskaskia River. The levee districts within this sector are: Dively, Vandalia, Santa Fe, Hanover, Germantown, and Heimann. This area is subdivided into sectors as described below: *

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Vandalia Sector

* Vandalia Sector extends from river mile 222 to river mile 105. The levee districts within this sector are: Dively and Vandalia. *

Bartelso Sector

Bartelso Sector extends from river mile 105 to river mile 30 (mile 30 new mile = mile 42 old mile). The levee districts within this sector are: Santa Fe, Hanover, Germantown, and Heimann.

River Sector

* The river sector includes the unprotected region on the Kaskaskia River from river mile 222 to river mile 36.5, from river mile 36.5 to the mouth is in the East Side Area. *

h. Cape Girardeau Flood Area (Office, Cape Girardeau, MO)

Cape Girardeau Area extends from the mouth of the Kaskaskia River, approximate river mile 118, downstream to the mouth of the Ohio River, river mile 0. This area is subdivided into sectors as described below:

Perry County Sector

* The Perry County Sector extends from river mile 111 downstream along the right bank of the Mississippi River, to approximate river mile 95, Mississippi River. The Drainage and Levee District in this sector is: Bois Brule Levee and Drainage District, Perry County, Missouri (both riverfront and back levees). *

Kaskaskia Island Sector

* Kaskaskia Island Sector extends from approximate river mile 122.5 downstream along the river bank of the Mississippi River, to approximate mile 111 and includes Ste. Genevieve County Levee District No. 2 and Kaskaskia Island Levee District. *

Degognia Sector

Degognia Sector extends from river mile 100 on the left bank of the Mississippi River to river mile 76 and includes the Degognia and Fountain Bluff and Grand Tower Districts.

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Ware Sector

Ware Sector extends from river mile 76 on the left bank of the Mississippi River downstream to river mile 46. The levee districts within this sector are: Preston, Clear Creek, East Cape Girardeau and Clear Creek, North Alexander, and Miller Pond.

Cape Girardeau, Missouri Sector

Cape Girardeau, Missouri Sector contains the metropolitan area of the city of Cape Girardeau between approximate river miles 53.5 and 50.0 and includes the Main Street Levee Improvement and North Main Street Levee Improvement Districts, Cape Girardeau, Missouri.

Olive Branch Sector

* Olive Branch Sector extends from river mile 39 downstream along the left bank of the Mississippi River, to approximate river mile 14. Due to its remote location, emergency flood fight assistance is provided to the Len Small Levee and Drainage District (open system) by the Olive Branch Sector. *

River Sector

The river sector includes the unprotected region between the Kaskaskia River, approximate river mile 122.5 downstream to the mouth of the Ohio River, river mile 0. *

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* 2-3. DISASTER ASSISTANCE. During natural disaster activities the St. Louis District (SLD) will coordinate its efforts with state and local interests (Federal and non-Federal) and with the Lower Mississippi Valley Division (LMVD) Emergency Management Branch. The SLD will usually be concerned with implementing emergency operation activities during a natural disaster within its boundaries and some of the duties will include, but are not limited to the following: *

a. Operate and preserve Federally owned and maintained Flood Control Works and other facilities operated by the Corps of Engineers.

b. Furnish technical assistance to state and local authorities upon request.

c. Assume flood fight operations when local interests (Federal or Non-Federal) are unable to cope with the emergency situation (a written request is mandatory).

d. Coordinate activities with other Federal agencies.

e. Report natural disaster situations and actions taken to higher authority.

2-4. FLOOD EMERGENCY ASSISTANCE. DP 500-1-3, a District Pamphlet available in the Emergency Management Branch (LMSOD-E), outlines the type of assistance that is available and how to apply.

a. Federal Disaster Index (See DR 500-1-3, Natural Disaster Plan for local interests, Appendix B).

b. FEMA, PL 93-288, assistance (See Chapter 9 of this plan).

c. State of Missouri, Emergency Management Agency.

d. State of Illinois, Emergency Services and Disaster Agency.

Request for Federal assistance should be coordinated through the various state offices before Corps of Engineers may expend their resources.

2-5. INSPECTIONS OF NON-FEDERAL FLOOD CONTROL WORKS. Non-Federal Flood Control works never inspected by the Corps of Engineers must meet the criteria as set forth in ER 500-1-1 to be eligible for rehabilitation (PL 84-99, Rating Guide, Part I, Engineering Guide).

2-6. FLOOD EMERGENCY REQUEST AND APPLICATIONS (EXAMPLES).

a. Application for Emergency Flood Control Rehabilitation Work.

b. Application, Assumption of a Flood Fight.

c. Application, PL-99, Levee Analysis for Non-Federal Flood Control Works.

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**FLOOD EMERGENCY REQUESTS AND APPLICATIONS
EXAMPLE**

**U.S. ARMY CORPS OF ENGINEERS
APPLICATION FOR EMERGENCY FLOOD CONTROL REHABILITATION WORK
(Under provisions of existing Flood Control Laws)**

From: _____
(Agency, District or Private Owner) (Address)

(City, State, and Zip) (Date)
TO: DISTRICT ENGINEER, _____ DISTRICT, CORPS OF ENGINEERS

IT IS REQUESTED THAT THE CORPS OF ENGINEERS, U.S. ARMY, ASSIST IN REPAIRING
DAMAGE CAUSED BY HIGH WATER DURING 19__ AS FOLLOWS:
(State briefly below the work requested)

The emergency work will be located on the _____ River and
will provide flood protection to _____ (Total) Acres, including _____
acres in cultivation with the principal crops as follows:

_____ (crop)	_____ (acres)	_____ (crop)	_____ (acres)
_____ (crop)	_____ (acres)	_____ (crop)	_____ (acres)

IT IS AGREED THAT THE FOLLOWING COOPERATION WOULD BE PROVIDED SHOULD THE
REPAIR WORK BE ACCOMPLISHED BY THE CORPS OF ENGINEERS, IN ADDITION TO THE
REQUIREMENTS BELOW, LOCAL INTERESTS MUST CLEAR BORROW AREAS AND REMOVE DEBRIS
PRIOR TO ANY AUTHORIZED REPAIR WORK AND:

a. Provide without cost to the United States all lands, easements and
rights-of-way necessary for the authorized work;

b. Hold and save the United States free from damages due to the
authorized work, exclusive of damages to the fault or negligence of the
United States or its contractor;

c. Maintain and operate, in a manner satisfactory to the Chief of
Engineers, all the rehabilitation work after completion, and all interrelated
portions of the flood control works not requiring repair or restoration such
as levees, berms, drainage structures, bank protection, etc.

d. Comply with all applicable portions of the Uniform Relocation
Assistance and Real Property Act of 1970, Public Law 91-646;

e. Comply with Section 601 of Title VI of the Civil Rights Act of
1964, Public Law 88-352, that no person shall be excluded from participation
in, denied the benefits of, or subjected to, discrimination in connection
with the project on the grounds of race, creed, or national origin.

Signature of Owner or Authorized Representative

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Sketch in levee, giving top width and approximate height for each section.
Show approximate location of all damage and approximate quantities required
to repair. Show Section, Township, and Range numbers, or other identifier.
Show Streams and lakes; show any connecting levees on adjacent property.

Section _____ Township _____ Range _____

County _____ State _____

Repair Required: Total Length
Total Estimated Cubic Yards:
No. of Acres Protected by Levee:
Estimated Yearly Value of Crops:

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FLOOD-EMERGENCY REQUESTS AND APPLICATIONS

EXAMPLE

REQUEST FOR CORPS OF ENGINEERS ASSISTANCE
(To assume a Flood Fight)

District Engineer
U.S. Army Corps of Engineers
210 Tucker Boulevard, North
St. Louis District
St. Louis, Missouri 63101-1986

Dear Colonel _____:

This letter is to confirm our telephone conversation on _____
(date)

regarding our request for Corps of Engineers assistance in flood fighting
along the _____ River in _____
(name) (State, county, city)

We request that the District Engineer, St. Louis, assume leadership of the
flood emergency forces and direct flood fight operations during existence
of this flood emergency. This request is made with the understanding that
such leadership is limited to operational control of emergency forces and
is subordinate to responsibilities and authorities of the state and local
subdivisions.

We agree that if the requested flood emergency action is undertaken by the
District Engineer, St. Louis, the _____ will:
(State, county, city)

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- a. Provide without cost to the United States all lands, easements and rights-of-way necessary for the authorized work;
 - b. Hold and save the United States free from damages due to the authorized work, exclusive of damages due to the fault or negligence of the United States or its contractor;
 - c. Maintain and operate, in a manner satisfactory to the Chief of Engineers, all the rehabilitation work after completion, and all interrelated portions of the flood control works not requiring repair or restoration such as levees, berms, drainage structures, bank protection, etc;
 - d. Comply with all applicable portions of the Uniform Relocation Assistance and Real Property Act of 1970, Public Law 91-646;
 - e. Comply with Section 601 of Title VI of the Civil Rights Act of 1964, Public Law 88-352, that no person shall be excluded from participation in, denied the benefits of, or subjected to, discrimination in connection with the project on the grounds of race, creed, or national origin.
-
-

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FLOOD EMERGENCY REQUESTS AND APPLICATIONS
EXAMPLE

PL 99 - Levee Analysis
For Non-Federal Flood Control Works

1. Flood Area: _____
Location: (County & State) _____

2. Name of Owner: (Address & Phone No.) _____

3. Data:
Closed System: _____ Yes _____ No
Length of Protection: _____
Height of Protection: _____
Acres Protected: _____
Overtopping Stage: _____ River: _____
Types of Crops: _____
Residential Structures: _____

4. Date of incident: _____

5. Cause of Damage: _____

6. Description of Damage: _____

a. Location of Borrow: _____

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b. Haul Distance of Borrow: _____

7. Previous Repairs by Whom: _____

8. Estimated Cost of Repair by local interests: _____

9. Status of Maintenance: (Such as heavy timber or grass) _____

10. Annual Maintenance Cost: _____

11. Access to Levee Site: _____

Width of Levee Crown Road, _____ Rock _____ Turf

12. Has State Contact or SCS been contacted for assistance: ____ Yes ____ No

13. Remarks: _____

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CHAPTER 3 DISASTER PREPAREDNESS

3-1. GENERAL. Disaster preparedness consists of planning, training, administration, supply and organizing activities designed to increase capabilities to facilitate a quick and effective response in times of a natural disaster or emergency.

a. Mission. The District Commander, working through the Emergency Management Branch, will prepare adequately, in advance, for flood emergency operations which he may be called upon to perform pursuant to the provisions of ER 500-1-1.

b. Annual Program. The St. Louis District Disaster Preparedness Program is formulated and funded annually according to organizational requirements. District programs are thoroughly reviewed by Division for compliance with program guidelines before forwarding to DAEN-CWO-EO for authorization and work allowance.

(1) Program features have been established as follows to coincide with activities under the Disaster Preparedness Program:

Corps statutory authorities (110), Activities in support of others (120), Facilities (130) and Inspections (140).

(2) Other detailed guidance pertaining to flood control and coastal emergencies are provided in ER 11-1-320 and ER 500-1-1.

3-2. SUSPENSE DATES. Each division, branch and separate offices must review their portions of this plan and furnish review comment to the Emergency Management Branch by 15 February annually. Also, negative responses will be included. Special emphasis must be placed on Flood Emergency Organization Personnel (see Appendix I of this plan).

3-3. NATURAL DISASTER RESPONSE PLANS. The district plans are: DR 500-1-1 Natural Disaster Response Plan, DR 500-1-2 Emergency Communications Plan (ECP), DR 500-1-3 Natural Disaster Assistance Plan for local interests, DR 500-1-4 Oil and Hazardous Materials Incident Contingency Plan, DR 500-1-5 Processing Pl 84-99 Requests and ER 500-1-6 Earthquake Response Plan. These plans will be reviewed and updated annually by 1 April and kept current. For distribution see appendix K of this plan.

3-4. DISASTER PREPAREDNESS PROGRAM. The SLD shall place continuing emphasis on the scope and working facets of PL 84-99 (Natural Disaster Procedures) and PL 93-288 (Disaster Relief Act of 1974). SLD proposed actions and procedures must be thoroughly and continually planned,

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documented, taught and practiced. The SLD must be responsive to the public needs. During a flood or other natural disaster emergencies the full capabilities and authority of the Corps shall be utilized for the common good to save human life, prevent human suffering and to protect property.

a. The SLD shall also facilitate a quick and effective response in times of a flood emergency or other natural disasters. The Emergency Management Branch shall provide policy and guidance pertaining to PL 84-99 and PL 93-288 in the form of manuals or pamphlets. Supplies and equipment shall be maintained in the state of readiness, to cope with any emergency, and the Emergency Operations Center (EOC) shall be maintained and kept up to date with the most current data available. Suppliers shall be kept informed on the Corps needs expected during an emergency.

b. The Disaster Preparedness Program provides the nucleus for the SLD in planning for immediate response to a Flood Emergency. However, ER 500-1-1 provides the overall policy and guidance for Natural Disaster Procedures.

c. The SLD shall maintain a comprehensive program concerning flood emergencies and other Natural Disaster Activities, to be prepared for immediate response to any natural disaster situation which may arise.

d. The SLD must establish a more comprehensive program concerning hazard mitigation and hazardous materials and to coordinate training with other federal, state and local governments.

3-5. INFORMATION OF SPECIFIC VALUE TO EOC, AREA ENGINEERS AND STAFF.

(The following conditions may prevail prior to activation for flood duty).

a. Anticipated Field Conditions.

(1) Access to levee crown roads and ramps may not be properly maintained by local interests.

(2) A lack of personal contact with local interests and personnel data as to where they reside and how and where to locate them during activation and emergencies, has been a problem in the past.

(3) River Stage and discharge forecast information has, in the past, been late during floods and not always reliable.

(4) Accessibility to rough terrain vehicles (4WD) has in the past, presented a problem.

(5) There is a current lack of capability to transport flood fight equipment and supplies immediately upon activation of a flood emergency.

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b. Suggested Actions.

(1) Proper maintenance of the roadway cannot be over-emphasized. These roadways provide an all-weather access for flood fighting operations which will expedite passage of equipment, materials, supplies and personnel required for an emergency and could be vital to saving lives.

(2) The EOC and Flood Area Engineers must maintain a better line of communications and point of contact prior to emergencies. The use of citizens band type communications would be helpful in keeping contact during emergencies located at area offices.

(3) The EOC will continue to establish a priority procedure with the National Weather Service to receive the most updated river forecast, discharges and other weather information available. The use of unlisted telephone numbers and radio communications could be utilized.

(4) Reserve all rough terrain vehicles (4WD) from the District Office and Field Activities for Area and Sector Engineers prior to activation and during emergencies. If needed, rental of these types of vehicles could be utilized.

c. Lessons Learned.

(1) To provide a "ONE-STOP" shopping service through the EOC.

(2) Activate supplies, equipment and communications procedures immediately instead of waiting an additional one or two days to see how the situation develops. This would save time and become more beneficial.

(3) Provide in-house training for Flood Fight personnel annually and maintain verbal contact quarterly with flood area and sector engineers to insure continuity between the existing and newly assigned Flood Fight personnel.

(4) Additional inspection time is required for familiarization of the actual area for newly assigned and existing Flood Fight personnel during the Spring inspection between Corps personnel and local interests.

(5) Provide hands on experience for Corps personnel and local interests on how to construct various flood fight techniques such as; sandbagging, ringing sand boils and construct temporary sand levees with the use of plastic film. Also, these presentations could be video taped and kept on hand to be utilized during Spring meetings.

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3-6. SANDBAG AND MATERIAL POLICY (The following letter has been furnished to Local Interest on January 27, 1984)

Operations Division

To Local Levee and Drainage District Officials
and Private Levee System Owners

This letter is to provide guidance and clarification of the Corps of Engineers policy regarding assistance to state and local interests during emergency flood fight operations. Specifically, I will address distribution of flood fight supplies and equipment such as sandbags, polyethylene sheeting, snow fence, pumps, generators, boats and motors.

The Corps of Engineers roll is to provide "supplemental" support to state and local interests during flood fight operations. The state and local interests have the primary responsibility for expending sufficient resources to insure effective flood fight preparedness. Maximum use of "local resources" must be made before assistance, in the form of supplies and equipment, can be "provided" by the Federal Government. Typical preparedness activities by local interests should include the stockpiling of adequate flood fight supplies such as sandbags, polyethylene sheeting and snow fence, advance rental or procurement of equipment such as pumps, generators, boats and motors. Also included are the preparation of flood response plans and proper maintenance of any existing flood protection facilities. Flood fighting supplies, in sufficient quantity, should be stockpiled to meet the total needs of flash floods and lesser floods of longer duration, as well as the initial requirements of a major flood occurrence.

When unusually heavy rainfall occurs, the St. Louis District will establish contact with local officials to determine the extent of flooding. This procedure also applies to other related natural disasters. If warranted, District flood fight personnel will be dispatched to the affected areas to conduct reconnaissance and provide technical assistance. If it appears that major flooding may occur and state and local flood fighting supplies become exhausted, Corps assistance can be expanded upon request from local interests through the state emergency agency. Requests for assistance received directly from local interests will be referred to the state emergency agency to determine whether state assistance is available. The state must be actively involved in the flood fight response before Corps assistance is provided.

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The Corps will no longer maintain large quantities of stockpiled sandbags, polyethylene, and snow fence to provide total requirements for distribution to state and local interests during flooding. Local interests will be provided the names of local suppliers on request.

- * Nonexpendable equipment/supplies such as pumps, generators, boats, and motors will be provided to local interests only when it has been demonstrated that those resources cannot be secured at state and local expense, or in time to be effective. Locals will, in all cases, be responsible for operation, maintenance, and return of the equipment in a condition similar to that when received. *

- * In summary, this clarification of existing Corps policy is not intended to diminish the level of support during natural emergency situations, but to encourage state and local interests to assume a more active roll in preparedness measures. *

- * If there are any questions regarding this subject, please contact Mr. Lou Chiodini, Chief, Emergency Management Branch, U.S. Army Corps of Engineers, St. Louis District, St. Louis, Missouri 63101-1986, telephone (314) 263-5705. *

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3-7. INSPECTION OF COMPLETED WORKS PROGRAM. Maintenance inspection of Levee and Drainage Districts along with Pumping Stations are performed annually in the Fall. The purpose of these inspections are to assign a maintenance rating to each of the Levee and Drainage Districts and Pumping Stations to insure that their maintenance obligations are being performed according to their O&M assurances and that at least a minimum rating of "Satisfactory" (S) is obtained to become eligible for rehabilitation if destroyed or damaged by a flood or highwater (See DIVR 1130-2-304). Funding for these inspections are from Appropriation 96X3123, O&M General.

* 3-8. INSPECTION OF COMPLETED PL-99 WORKS PROGRAM. Maintenance inspection of Private Levee Systems are performed annually in the Fall. Currently, * their are 39 private levee systems. These are inspected every year. These systems are those who have received PL-99 assistance in the past. As stated above, Private Levee Systems must maintain a "Satisfactory" (S) maintenance rating to be eligible for rehabilitation if destroyed or damaged by a flood or highwater (See PL 84-99, rating guide). Funding for these inspections are from Appropriation 96X3123, O&M General.

3-9. EMERGENCY OPERATIONS CENTER (EOC). The EOC is located on the 10th floor in room 1040 of the New Federal Building, 210 Tucker Boulevard, North, St. Louis, MO 63101-1986. The EOC telephone numbers are 314-263-5200 through 314-263-5209.

3-10. INSTRUCTIONS AND CHECK LIST FOR SETTING UP AND OPERATING THE EOC.

a. Activation of the EOC will be under the following conditions:

(1) Flood Fight Conditions - Detailed procedures are provided in Chapter 4 of this plan, page 4-2 under stages for Activation.

(2) Mobilization, Real/Play - As directed by Division or higher authority.

(3) Other Natural Disasters Under PL 93-288 - Detailed procedures are provided in Appendix A, Part II of this plan, page A-14.

b. Check list for EOC:

* (1) Activate Wire Communications System through LMSIM-SO - * detailed procedures are provided in DR 500-1-2, Emergency Communications Plan (ECP).

* (2) Coordinate with LMSIM-SO on other Wire Communications Systems * as required - detailed procedures are provided in DR 500-1-2 ECP.

* (3) Activate Radio Communications through LMSIM-SO - detailed * procedures are provided in DR 500-1-2, ECP.

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DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL SOD-E	SUBJECT Activation of SLD Emergency Operations Center (EOC)
-------------------------------------	--

TO TAA FROM LMSOD-E DATE date CMT 1
Chiodini/3-5705/87 Operate

1. Purpose of Activation: The SLD Emergency Operations Center is activated this date in anticipation of extended hours of operation due to _____.

2. Location of EOC: Room 1040.

3. Telephone Numbers EOC: Commercial: 314-263-5200 through 263-5209.

4. Organization of the EOC: Each division and separate office will furnish a representative to respond to EOC request for support/data.

5. Records: Each division and separate office will maintain a daily journal of the emergency actions performed, and will insure all messages received and transmitted in connection with the emergency are logged through the EOC.

6. Authorization For Extra Working Hours: Issuance of this activation notice does not constitute authority to perform compensatory or overtime work unless authorized by the District Commander.

7. Duty Schedule:

Date:

Duty Hours:

Duty Officer:

Home Telephone Number:

8. Personnel Requirements: Additional personnel will be made available by elements of SLD as indicated in this or subsequent directives.

LOUIS J. CHIODINI, JR., PE

Chief, Emergency Management Branch

CF:

LOCKS AND DAMS

L&D 24
L&D 25
L&D 26
L&D 27

LAKE PROJECTS

OD-RC
OD-RS
OD-RJ
OD-RM
OD-RR
OD-RW

PROJECT OFFICES

PO-L
PO-U
RU-L
Service Base

FLOOD AREA ENGINEERS

LMSOD-CC (Chrismore)
LMSOD-RS (Skinner)
LMSPD-F (Hahn)
LMSPD-M (Corbin)
LMSPO-L (Busch)
LMSPO-U (Grojean)
LMSRO-C (Grojean)
LMSOD-C (Ross)

RESIDENT OFFICES

RO-C
RO-F
RO-L

*

*

*

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(4) Provide proper data and establish the EOC for conditions stated in paragraph a, above.

(5) Provide all Forms, DF's, Cost Accounts and other essential data to activate EOC.

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CHAPTER 4 EMERGENCY OPERATIONS

4-1. GENERAL. The St. Louis District (SLD) Commander is responsible for the overall accomplishment of authorized emergency missions in accordance with the policies, responsibilities, duties and functions prescribed in this plan and ER 500-1-1. He will activate the Emergency Management Branch, District Staff and Area and Sector Engineer personnel who are knowledgeable in the requirements, authorities and needs within the St. Louis District.

4-2. POLICY. In time of a flood, Emergency Operations will be under taken by the Corps of Engineers to supplement state and local activities when local interests (Federal and Non-Federal) have fully committed all physical resources available to the maximum extent feasible.

a. Responsibilities and Functions. See Appendix A, Part I, of this plan.

b. Activate Flood Area and Sector Engineers, detailed functions are provided in Appendix A, Part I, paragraph K(2) of this plan. For flood emergency areas see Chapter 2, of this plan, and for activation see this chapter page 4-2 and Appendix D of this plan.

4-3. FLOOD EMERGENCY PHASES.

a. Phases of Flood Fight. The development of a full flood fight usually progresses through several phases. However, in some instances a potential flood may not develop to the extent that more than one or two phases of activity are warranted. The District Commander will declare the phases of the flood emergency on the basis of analysis and evaluation of the flood data by the Chief of Operations Division and Chief of the Emergency Management Branch. For the purpose of establishing standing operating procedures, the flood emergency activities have been divided into four phases as follows:

(1) Notification Phase. A prediction of the impending flood shall be made known at the earliest practicable time based on information received from rainfall and upstream river stage data. A notification or warning should be issued to all the District personnel concerned, including field offices. Flood Area Engineers will alert local levee districts in the area affected. A review should be made of flood protection projects and projects under construction. Plans should include a proposed assignment of personnel and equipment for patrolling and maintaining the areas which may be activated. Equipment, transportation and communication facilities should be checked and placed in operating condition. The extent of this planning and preparation will depend upon the nature of the flood prediction.

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(2) Phase I - Activation. Based upon action indicated by the predicted magnitude of the impending flood, flood area offices and levee patrols should be activated and closure of openings in local flood protection projects initiated by local interests. The physical resources available to the District Commander should be placed on a standby basis. It is a local responsibility to procure and stockpile flood fight supplies prior to the flood season, as continued donation of Federally procured supplies will not promote preparedness acquisition by local interests. Flood fight supplies will be furnished local interests only in time of flood to supplement local efforts. In situations where there are no alternatives to providing supplies to local interests or a community which is experiencing a flood and where local preparedness has not been accomplished, that community should be made aware that reimbursement for Corps loaned supplies is expected.

Note: Stage activation will normally be ordered when it is predicted that stages will reach heights as indicated in the following table, with further sustained rises above those stages anticipated. The activation stages indicated need not be considered as automatic, arbitrary, or inflexible, but will serve as a guide with actual activation being ordered only after careful study of the particular situation:

Stages at Which Activation Will
Normally be Ordered
(for additional activation stages see Appendix D)

Gage Location	Flood Stage (Feet)	Activation Phase I (Feet)	Stages ^a Phase II (Feet)
New London, Missouri	19	21	23
Louisiana, Missouri	15	17	19
Lock & Dam No. 25 (TW)	26		
Lock & Dam No. 26 (TW)	21	32	39 ^b
St. Louis, Missouri	30	33 ^c	37 ^d
Brickeys, Missouri	26	33	39
Chester, Illinois	27	34	40 ^d
Grand Tower, Illinois	28	35	42
Cape Girardeau, Missouri	32	38	42
Beardstown, Illinois	14	22	25
Vandalia, Illinois	18	18 ^e	22
Valley Park, Missouri	16	20	22

*

*

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a. Reading of piezometers and pressure relief wells will be in accordance with stages in the Operating Manual prepared by Foundations and Materials Branch (Geotechnical Safety and Evaluation).

b. Except private levees vicinity West Alton and St. Peters, Missouri: 420.0 for Phase I and 423.0 for Phase II.

c. Except Chouteau Island: 32.5 for Phase I and 35.0 for Phase II. River des Peres: 33.0 for Phase I and 36.0 for Phase II.

d. Except Kaskaskia Island: 31.0 for Phase I and 34.0 for Phase II.

e. Due to possibility of rapid rise of the Kaskaskia River, Phase I may have to be initiated at 16 feet.

NOTE: For further information on gages, see Appendix C, this plan.

(3) Phase II - Flood Fighting. Patrolling may be placed on a 24-hour basis (two 12-hour shifts) with frequent contact being made with Area Engineers, Sector Engineers and the District office. Supplemental aid, including personnel, equipment and supplies, should be given to local interests to the extent the District Commander considers warranted to protect the works. If the local resources have been exhausted or if the problem is of such magnitude that local interests are incapable of coping with it, the District Commander should make every effort to render adequate assistance to other publicly recognized relief and rescue organizations and when called upon, and assume full responsibility for directing the flood fight.

(4) Recession Phase. This phase of the flood emergency covers activities after the flood has crested and river has begun to fall. While it might be considered that the crisis has passed, no relaxation of patrolling or flood fighting measures should be made until the flood approaches within bank stages. In many instances, disastrous failures have resulted after it was assumed that the fight was won or as the result of a second rise. During the recession of the flood, plans for rehabilitation of the area should be formulated and, if emergency repairs are necessary, consideration should be given to accomplishing them in such a manner as to reduce to a minimum the hazard of subsequent flooding of protected lands before repairs can be accomplished.

b. Deactivation. Deactivation should be accomplished in an orderly manner so as to leave the area as clean and in as near its original condition as possible.

4-4. REPORTING PROCEDURES. Detailed procedures and guidance are provided in ER 500-1-1, Appendix G.

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4-5. AFTER ACTION REPORT. The after action report outline as addressed in ER 500-1-1, Appendix G, is superseded by the following format outline: (Reference Letter DAEN-CWO-EO dated 11 Sep 84, SAB)

LMSOD-E/LMSPD-E

date

SUBJECT: After Action Report, _____

Commander, Lower Mississippi Valley Division
ATTN: LMVCO-E

- 1. Authority
- 2. Scope
- 3. Description of the Disaster Event
- 4. Emergency Operations
 - a. Organization
 - b. EOC Operations
- 5. Flood Fight Activities by Flood Emergency Areas
- 6. Coordination
- 7. Official Advisories, Notices and Actions taken by Emergency Operations Center
- 8. Post Disaster Activities
 - a. FEMA PL 93-288
 - b. Rehabilitation PL 84-99
- 9. Special Problems, Solutions, Strengths and Weaknesses of the Operation
- 10. Evaluation
- 11. Problems Encountered

FOR THE COMMANDER:

JAMES A. PETERSEN
Chief, Operations Division

4-6. PHOTOGRAPHIC COVERAGE OF EMERGENCY OPERATIONS. Detailed procedures are provided in Chapter 11 of this plan.

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CHAPTER 5
REHABILITATION CODE 910-300

5-1. AUTHORITY.

Chief of Engineers Authority. The Chief of Engineers has authority under PL 84-99 to develop standards and criteria for and to perform rehabilitation of any flood control work or federally authorized and constructed shore protection project threatened or damaged by flood, hurricane or coastal storm.

5-2. GENERAL.

a. PL 84-99 authorizes repair and restoration of the following projects to ensure their continued function.

b. All flood control projects.

c. Modification of works to increase the degree protection to a larger area, is beyond the scope of PL 84-99. Such major modifications must be accomplished at non-Federal expense, under Congressional authorization and appropriation, or under special continuing authorities of the Corps. Modifications to increase the reliability of the existing degree of protection must meet the criteria established in this chapter to be eligible for funding under PL 84-99.

d. Time Limitation for Rehabilitation Reports. The District Commander will submit post-disaster rehabilitation letter reports to the Division Commander within 90 days following the declaration of a major disaster by the President. If no Presidential declaration is made, or if prolonged high water prevents an effective damage survey, the Division Commander will determine the commencement of the 90-day time period. Public notice BY THE DISTRICT COMMANDER should be made immediately after a disaster incident, alerting non-Federal interests that a 30-day submittal deadline is in effect for Corps assistance to report damaged flood control, hurricane and control protection projects under PL 84-99. When warranted, the Division Commander may request approval from DAEN-CWO-EO to extend the time limitations. The Division Commander will take action on the District Commander's reports within 15 days after receipt. Likewise, when HQUSACE action is required it will be taken within 15 days of receipt of a report from the Division Commander.

e. Commencement of Rehabilitation Projects. Rehabilitation work (actual construction) will commence within 60 days following receipt of approval from higher authority unless extended for good cause by the Division Commander. Such extensions may not exceed 60 days without approval from CDR USACE (DAEN-CWO-EO). Information copies of division extensions will be furnished to CDR USACE (DAEN-CWO-EO), WASH DC 20314-1000.

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*

Utilization of appropriate emergency procurement procedures detailed in Chapter 10 of ER 500-1-1 is authorized to ensure rapid accomplishment of the required rehabilitation work.

*

f. Requirements for Local Cooperations and Participation. See Part I of this chapter, page 5-8.

g. Contributed Funds. See Part II of this chapter, Page 5-12.

5-3. RESTRICTIONS.

a. Maintenance Deficiencies. Rehabilitation under PL 84-99 will not be applied to works which, as a result of poor maintenance, have deteriorated to the point where substantial reconstruction is required. All deficient or deferred maintenance outstanding when damage occurs will be accomplished by or at the expense of the responsible non-Federal interests, either prior to or concurrently with authorized rehabilitation work. When work accomplished by the Corps also corrects accumulated deferred maintenance, the estimated deferred maintenance cost will be borne by local interest. This policy does not preclude furnishing flood fight assistance in an emergency.

b. Economic Justification. No project will be repaired unless the repairs have a favorable benefit-to-cost ratio.

5-4. PROJECT DEVELOPMENT. In early negotiations, the project sponsor will be informed of the requirement for cost sharing (if it is a non-Federal project) and work items which must be accomplished at non-Federal cost. This includes both maintenance deficiencies and any modifications which are necessary to preserve the integrity of the entire project but are beyond those authorized under PL 84-99. The sponsor will be specifically informed that the extra cost of such work must be borne by the non-Federal interests. In reporting on this aspect of a proposed project, recommendations will take into account the need for expeditious action, the history of previous efforts by non-Federal interests, and other pertinent factors if variations are recommended. In this connection, the fact that proposed modifications conform to an authorized protection project on which construction has not been initiated does not justify construction with emergency funds.

5-5. SPECIAL CONSIDERATIONS AND ALTERNATIVE METHODS OF REHABILITATION.

a. General. Alternative methods for providing equivalent protection may be employed provided the estimated Federal costs under such procedures do not exceed those for rehabilitation of the existing works. Alternative methods such as levee setback, revetment, bulkheads, or seawalls should also be considered to avoid threats to the integrity of the works. These alternatives must be beyond the scope of non-Federal maintenance responsibilities or capabilities. Environmental effects must be considered

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when evaluating alternatives. Any increase in Federal cost resulting from non-Federal preference of an alternative, other than the one that is least expensive when all costs are included, will be borne by the non-Federal interests.

b. Bank Protection vs. Levee Setback. No commitment will be made to non-Federal interests regarding restoration of the levee to a previously existing alignment. If the levee cannot be reconstructed to the previous alignment due to changed physical conditions (flood induced) or excessive construction costs, alternative plans will be compared on a technical and economic basis. WHEN BOTH METHODS of reconstruction are possible but relocation is more economical, any extra Federal costs required to protect the levee on its existing alignment will be borne by the non-Federal interests. Comparison will be based on the following evaluation procedures:

(1) Assume the same standard of flood protection (costs attributable to an increased standard will be separately considered).

(2) Estimate the respective economic lives and compare all costs on an annual basis.

(3) Levee setback cost estimate will include costs of engineering and construction; relocation of roads and utilities; and rights-of-way exclusive of any allowance for land severance or depreciated value of land not in rights-of-way.

(4) Bank protection cost estimate will include costs of engineering and construction; cost of additional rights-of-way; and cost of maintenance.

(5) Include, in both estimates, any other associated costs to non-Federal interests.

c. Deliberate Levee Cuts. Repair of deliberate levee cuts is a non-Federal responsibility and should be accomplished at non-Federal expense. Variation from this general policy will be considered by HQUSACE where the purpose of the cut was to preserve existing flood control works. If local interests ask the Corps to breach a levee, they must provide assurances that the repair will be made at local expense.

5-6. CORPS FLOOD CONTROL PROJECTS.

a. Definition. A Corps flood control project is a project, or component thereof, which was authorized and funded by the Federal government, except under PL 84-99; constructed by the Corps of Engineers; and has flood control as a stated purpose. A project or component constructed under PL 84-99 would qualify if it replaced a Corps flood control project. In addition, locally constructed components of projects incorporated into the overall project design and authorization is also classified as a Corps project.

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b. Modifications. Modification of a Corps project may be accomplished in conjunction with post-flood rehabilitation at Corps expense when changed physical conditions (flood induced) prohibit the reconstruction of the project to its pre-flood condition. Modifications should not be made to repair projects which have exceeded expected project life, to correct major or minor deferred or deficient maintenance, or to expedite repairs which might be performed at a later date under a more appropriate authority. Modifications where appropriate may include:

(1) Addition of slope protection.

(2) Setback when the levee and riverward protective overbank areas batture have been lost.

(3) Replacement of hand-placed riprap with thicker dumped rock due to excessive cost of restoring hand-placed protection.

c. Flood Control Works Under Construction by the Corps. Rehabilitation of these structures will normally be accomplished with regular project construction funds. If a project is functional, even at a level lower than authorized, PL 84-99 funding may be used for rehabilitation if construction funds cannot be provided in the required time. Funding transfer authorities must be considered in determining funds availability.

For a project which is funded under Construction, General and is underway, THAT HAS PROJECT FUNDS which have not been obligated to construction, should use those remaining funds for the emergency activities. The use of PL 84-99 funding must be approved by HQUSACE. PL 84-99 funds may not be used to perform construction beyond what was in place at the time of damage.

5-7. NON-FEDERAL FLOOD CONTROL PROJECTS.

a. Scope of Work. The Corps will provide assistance in the rehabilitation of non-Federal projects only when repairs are clearly beyond the normal operation and maintenance responsibilities of the local interests. However, the urgency of the work must be considered in determining whether it is within the capabilities of local interests.

b. Cost Sharing. For non-Federal projects eligible for restoration under PL 84-99, the Federal Government may bear up to 80 percent of the construction costs. The remaining costs will be the responsibility of the Local Sponsor. See Appendix D for details.

c. Definition. Non-Federal projects are projects constructed with other than Federal funds, or a component of such a project. A project constructed under Federal emergency disaster authorities, such as PL 84-99 or PL 93-288, is a non-Federal project unless it was built as a replacement

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for a damaged Federal project. A flood control project is a project designed and constructed to have appreciable and dependable effects in preventing damage from irregular and unusual rises in water level. NON-FEDERAL FLOOD DAMAGE REDUCTION MEASURES IN URBAN AREAS MUST MEET THE DEFINITIONS AND DECISION CRITERIA FOR FLOOD CONTROL WORKS AS PRESCRIBED IN ER 1165-2-21 TO BE CONSIDERED FOR REHABILITATION UNDER PL 84-99. For a multiple-purpose project, the term "flood control project" includes only those components that are necessary for the flood control function.

d. Eligibility. Any flood control project would be repaired one time, provided the work was economically justified and not otherwise prohibited by this regulation. Prior to the repair, the owner will be provided with a set of the ELIGIBILITY GUIDELINES, and informed that the project will be required to meet these GUIDELINES to be eligible for future rehabilitation. COMPLIANCE WITH THE GUIDELINES WILL BE VERIFIED THROUGH THE ANNUAL INSPECTION PROGRAM (SEE PART II OF THIS CHAPTER, PAGE 5-14). IF THE OWNER DOES NOT COMPLY WITH THE GUIDELINES THE PROJECT WILL BE INELIGIBLE FOR FUTURE REHABILITATION. However, flood fight assistance may still be provided.

e. Project Guidelines. THE PROJECT MUST BE DESIGNED AND MAINTAINED IN ACCORDANCE WITH THE GUIDELINES ESTABLISHED BY CDR USACE. THESE GUIDELINES ARE PROVIDED IN APPENDIX I. THE GUIDELINES FOR MAINTENANCE ARE DESIGNED TO BE CONSISTENT WITH THOSE FOUND IN 33 CFR 208.10 AND ER 1130-2-335.

f. Secondary Flood Control Works.

(1) Definition. A secondary levee is a levee constructed near, or tied into, the main levee (riverward or landward) and which provides a lesser flood protection than the main system.

(2) General Policy. Secondary levees landward of the main levee may be repaired if repairs are incrementally justified. Secondary levees on the river side should be discouraged in the interest of maintaining an unobstructed floodway and consistent with the spirit of E.O. 11988. They will not be repaired unless they protect human life, and will not be repaired if they create a one-foot increase in the floodway water surface elevation compared to the elevations used to design the main levee.

g. Modifications.

(1) In conjunction with post-flood rehabilitation, modifications may be accomplished at additional Federal expense to assure the integrity of the flood control works or when changed physical conditions prohibit the re-construction to pre-flood condition. The modification is limited to the damaged reach on the section of a non-Federal project which is being repaired. Where the scope of the repair for the project, includes a

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required modification, local interests are required to contribute the prescribed 20% cost share for the entire project and are also responsible for any additional work required to upgrade the undamaged portion of the project. Specific guidelines for bank protection in levee setback is discussed in paragraph 5-5b of this chapter.

(2) Modification should not be made to correct major or minor deferred or deficient maintenance or to expedite non-exigent repairs which might be performed at a later date by local interests.

(3) Modifications providing an increased degree of flood protection or for protecting an additional area are not authorized under the rehabilitation feature of PL 84-99.

h. Channels. Rehabilitation of non-Federal projects will not extend to the restoration of hydraulic capacity of the channel. This restriction does not preclude reclaiming material from the channel for use in the levee repair.

i. Nonconforming Works. Any non-Federal project constructed without having the appropriate local, state or Federal permits or waivers thereof will not be rehabilitated under PL 84-99. After the fact permits will be accepted as meeting this requirement only if obtained or applied for prior to the damage.

j. Coordination with Federal Agencies.

(1) Federal Emergency Management Agency (FEMA). Following a Presidential declaration of a major disaster or emergency under PL 93-288, FEMA regional directors will be informed of any applications pursuant to PL 84-99. Requests for work beyond the authority of PL 84-99 will also be coordinated with FEMA regional offices to determine the applicability of PL 93-288. The applicant should be informed accordingly.

(2) Department of Agriculture (USDA). All requests for rehabilitating agricultural levees should be coordinated with the Department of Agriculture local conservation representative to determine applicability under any USDA authority. Any works previously constructed, modified, or repaired with financial assistance from USDA, whether through Agricultural Conservation Program Service (ACPS) or Soil Conservation Service (SCS), and where USDA has authority to repair, will not be rehabilitated by the Corps.

k. Transfer of Completed Work to Local Interests. Such transfer will be in accordance with Part I of this regulation, page 5-13.

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5-8. REHABILITATION INVESTIGATIONS.

a. General. Following a flood or coastal storm event, a survey of damages to flood control and federally authorized hurricane or shore protection projects should be undertaken as soon as conditions permit. This survey would expedite the processing of requests and applications from non-Federal interests and avoid repetitious investigations in the same area.

b. Scope of Investigations. On-site investigation, engineering studies, and plans for rehabilitation should be held to the minimum necessary for evaluation of requested work. Where appropriate, modified existing drawings or aerial photographs should be used in lieu of finished drawings. In general, consideration should be given to the size of the job in determining a reasonable allocation for preliminary costs.

5-9. REHABILITATION LETTER REPORT.

a. Letter Report. A separate letter should be furnished for each individual rehabilitation project. The letter report should describe the damages and proposed repairs to provide the same degree of protection that existed prior to the flood or coastal storm event and present an evaluation of the effectiveness of the proposed repair. When modifications necessary for preserving the integrity of the works are incorporated, these items and associated added costs will be broken down into Federal and non-Federal costs of work items, including allocations for Engineering and Design, Supervision and Administration and overhead. The letter report should strictly adhere to the format in Appendix G, of ER 500-1-1.

b. Advance Report. An advance copy of the letter report may be transmitted by electronic facsimile when mail delivery will cause an unacceptable delay, and expedited review and approval procedures are required.

5-10. PROCEDURE AND GUIDANCE. Detailed procedures and guidance are provided in ER 500-1-1.

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PART I
LOCAL INTEREST COOPERATION AND PARTICIPATION

1. GENERAL.

a. Requirement for Cooperation and Participation. In order to obtain a firm understanding between the Corps and local interests concerning the responsibilities of each party in responding to a natural disaster, division or district commanders should negotiate a local cooperation agreement with local interests whenever assistance is furnished. The local interests may be public entities, organizations, groups or individuals. FOR ASSISTANCE TO OTHER THAN A PUBLIC ENTITY, IT IS REQUIRED TO HAVE A PUBLIC AGENCY SPONSOR THE PROJECT AND CO-SIGN THE AGREEMENT. PROJECT SPONSORS MUST BE ONE OF THE FOLLOWING:

- (1) LEGAL SUBDIVISION OF A STATE GOVERNMENT OR A STATE ITSELF.
- (2) LOCAL UNIT OF GOVERNMENT.
- (3) STATE CHARTERED ORGANIZATION, SUCH AS A LEVEE BOARD.

Agreements do not require approval by HQUSACE unless they contain special or unusual conditions of local cooperation and participation.

b. Requests for Assistance. For urgent situations, district/division commanders may respond to oral requests from responsible representatives of local interests. However, all oral requests must be confirmed in writing. Before furnishing assistance under Advance Measures, Code 910-500, or under the Clean Drinking Water portion of Code 910-400, the District/Division Commander must obtain a statement, signed by the Governor, stating that the State is aware of the request, identifying the problem verifying that all available state and local resources have been committed and requesting Federal assistance. For Emergency Operations, Code 910-200, the statement may be signed by an authorized state official and assistance can be furnished before the statement is received.

2. REQUIREMENTS OF LOCAL COOPERATION. Though not required by the provisions of PL 84-99, it is the Corps' policy that authorization of a project will, insofar as feasible, require local interests to furnish items of local cooperation similar to those set forth for flood control project construction in Section 3 of the 1936 Flood Control Act PL 74-738 (33 U.S.C. 701c). These requirements are that local interests provide without cost to the United States all lands, easements, and rights-of-way necessary for the authorized work; hold and save the United States free from damages due to

Note: Part I, is a reprint from ER 500-1-1, Appendix D.

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the authorized work, exclusive of damages due to the fault or negligence of the United States or its contractor; maintain and operate, in a manner satisfactory to the Chief of Engineers, all the works after completion. When assistance includes the construction of temporary protective works, the maintain and operate clause is modified by adding (or substituting, as applicable) the requirement for local interests to remove or upgrade any temporary works constructed by Corps under PL 84-99.

a. **Furnishing of Lands, Easements, and Rights-of-way.** This item provides for sites of structures, for borrow and disposal areas, and for access; also, for all other rights in, upon, through or over private property as needed by the United States in connection with the authorized work. Performance by the local interests under their assurances to furnish lands, easements, and rights-of-way will normally not be considered a contribution. If more advantageous to the Federal Government, borrow and disposal areas may be assumed as a Federal responsibility. Easements must be provided for future Federal inspection of maintenance or removal. If a public agency sponsors a project for a non-public applicant, the applicant must provide an easement to the sponsor for future maintenance or removal, as well as for Federal inspection. Easements should extend to the life of the project.

b. **Hold and Save Clause.** Where the property concerned is under tenancy, both the property owner and the tenant should sign the local cooperation agreement.

c. **Maintain and Operate Clause.** This clause must include: "It is understood that the foregoing maintenance and operation requirement extends to interrelated features of all protective work under the control of (insert name of owner or sponsor)."

d. **Cost Sharing.** THE FEDERAL GOVERNMENT MAY BEAR UP TO 80 PERCENT OF THE CONSTRUCTION COSTS FOR REHABILITATION OF NON-FEDERAL PROJECTS. SPONSORS MAY PROVIDE THEIR SHARE OF CONSTRUCTION COSTS IN THE FORM OF CASH, IN-KIND SERVICES SUCH AS LABOR OR EQUIPMENT, ETC., OR A COMBINATION OF CASH AND IN-KIND SERVICES. CASH CONTRIBUTIONS MAY BE RECEIVED AFTER PROJECT HAS BEEN APPROVED FOR CONSTRUCTION. THE SPONSOR'S SHARE IS IN ADDITION TO THE PROVISION OF REAL ESTATE INTERESTS.

e. **Removal of Temporary Works.** Local interests are responsible for the removal of all temporary works constructed by the Corps, which are unsuitable for upgrade to permanent structures. The wording must not preclude the use of other Federal assistance programs to fund removal. SUCH ACTION OR ACTUAL REMOVAL MUST BE INITIATED WITHIN 30 DAYS AFTER THE FLOOD THREAT HAS PASSED.

f. **Requests for Retention of Temporary Works.** IF LOCAL INTEREST DESIRES TO RETAIN THE TEMPORARY FLOOD CONTROL STRUCTURE, AFTER THE IMMEDIATE

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FLOOD THREAT HAS PASSED, IT MUST BE UPGRADED TO MEET REQUIREMENTS OF A PERMANENT STRUCTURE. THE RATING GUIDE, EXHIBIT A, APPENDIX I, MAY BE USED FOR GUIDANCE ON STRUCTURAL INTEGRITY WHEN CONSTRUCTING A PERMANENT FLOOD CONTROL STRUCTURE. LOCAL INTEREST SHOULD ACCOMPLISH THE IMPROVEMENTS WITH THEIR OWN FUNDS, HOWEVER THEY MAY REQUEST STRUCTURE UPGRADING UNDER SECTION 205 OR OTHER CORPS AUTHORITIES AS APPLICABLE. ANY UPGRADING MUST BE INITIATED WITHIN 30 DAYS AFTER THE FLOOD THREAT HAS PASSED AND COMPLY WITH ALL LOCAL AND/OR FEDERAL PERMITS, ENVIRONMENTAL, CONCERNS, ECONOMICAL BENEFITS, AND ALL LEGAL REQUIREMENTS. UNLESS UPGRADED, RETENTION OF SUCH STRUCTURES WILL BE IN VIOLATION OF THE LOCAL COOPERATION REQUIREMENTS PRESCRIBED IN THE ASSURANCE AGREEMENT AND MUST BE REMOVED IN ACCORDANCE WITH SUBPARAGRAPH E ABOVE. UNLESS UPGRADED, SUCH STRUCTURES ARE NOT ELIGIBLE FOR REHABILITATION (CODE 300) BY THE CORPS. FUTURE FEDERAL ASSISTANCE WILL BE JEOPARDIZED WHERE VIOLATION OF THE LOCAL COOPERATION AGREEMENT, HAS BEEN NOTED FOR MAKING DETERMINATIONS ON FEDERAL ASSISTANCE IN CASES WHERE VIOLATIONS HAVE BEEN PREVIOUSLY NOTED, REFERENCE SHOULD BE MADE TO PARAGRAPH 3e, BELOW.

3. ADDITIONAL REQUIREMENTS.

a. Maintenance Deficiencies. Rehabilitation and Advance Measures authorities may not be used to correct deferred or deficient maintenance. Such correction must be accomplished by, or at the expense of, local interests. This may include restoring normal levee or dune height after subsidence, replacement of deteriorated components such as outlet structures and pipes, removal of debris and other obstructions in adjacent channels, and new construction such as protection against erosion. This does not preclude furnishing flood fight assistance during an emergency.

b. Areas of Minor Damage. Separable areas with minor damage should be included in the maintenance program of local interests.

c. Borrow Source. The project sponsor is responsible to make borrow available to the Corps from any of their sources which are determined to contain suitable material. Otherwise, the Corps will obtain suitable material from the nearest available source, TO IMPLEMENT EMERGENCY WORK.

d. Relocations. Any roadway, utility, structure, etc. relocations required by an approved levee rehabilitation plan are the responsibility of local interests.

e. Adequacy of Requirements of Local Cooperation. In determining the adequacy of the pledge of local cooperation, district/division commanders must give proper consideration to the local sponsor's performance capability, taking into account any shortcomings in meeting prior commitments. If feasible, provisions should be made for local interests to establish a "Contingency Fund" to meet future maintenance requirements if apparent inadequacies of MAINTAINING protective works WAS DUE TO unusually high water.

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f. Privately Owned Projects. PL 84-99 activities may involve flood control or water supply facilities owned by individuals, organizations or other non-public entities. In such cases the local cooperation agreement furnished by each property owner MUST be sponsored THROUGH a public entity or organization fully responsible for maintenance of the structure. This organization is to furnish THE ASSURANCES OF local cooperation agreement for acceptance by the District Commander.

g. Eligibility Under Other Programs. The local cooperation agreement must be worded to allow local interests to accept funding from other Federal programs for meeting the local responsibility. For example, removal of temporary works will be without cost under Corps PL 84-99 assistance, but will not be "at no cost to the United States."

4. POLICIES FOR SPECIFYING LOCAL COOPERATION.

a. Disaster Preparedness, Code 910-100. Corps participation with local interests usually involves activities that do not require local cooperation agreements. However, an agreement would be in order when Corps-owned equipment, such as pumps, is loaned to local interests.

b. Emergency Operations, Code 910-200. In time of flood or coastal storms, emergency operations are to be undertaken by the Corps of Engineers to supplement local efforts. Any such protective and preventive measures constructed by the Corps will generally be of a temporary nature. Local interests must furnish the basic a-b-c requirements and remove or upgrade all temporary works constructed by the Corps. The local sponsor will be notified of these requirements verbally before assistance is provided. The written local cooperation agreement will be obtained as soon as practicable but does not have to be signed before aid is initiated, BUT WILL BE SIGNED BEFORE WORK IS COMPLETED.

c. Rehabilitation, Code 910-300. The a-b-c requirements AND OTHER applicable portions of this appendix of local cooperation will be obtained, from the local project sponsor, PRIOR TO COMMENCEMENT OF WORK.

d. Emergency Drinking Water, Code 910-400. The request for assistance must identify the threat to public health and welfare as determined by recognized health authorities. In addition to obtaining the a-b-c requirements of local cooperation, the agreement may require operation and maintenance of all work PROVIDED during the emergency and removal and other of same when feasible at the end of the emergency. Also, include other applicable portions of this appendix as appropriate.

e. Drought Assistance, Code 910-400. The applicant must provide the basic a-b-c requirements. For well construction the applicant must pay the reasonable cost, as defined in Chapter 6, and obtain all necessary Federal,

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State and local permits. For transport of water the applicant must purchase the water, load it into and discharge it from the conveyance, and furnish an adequate storage facility at the terminal point.

f. Advance Measures, Code 910-500. In addition to the a-b-c requirements of local cooperation, local interests must remove or upgrade any temporary works constructed by the Corps. Local interests are also responsible for correction of deficient or deferred maintenance ON A STRUCTURE THAT HAS BEEN UPGRADED. Additional items from this appendix may be added if appropriate.

g. Disaster Assistance Under PL 93-288. PL 93-288 includes a specific provision to the effect that the Federal Government shall not be liable for claims based on actions or omitted actions by a Federal employee or agency in providing Federal assistance under the PL 93-288 authority. District/Division Commanders should obtain a copy of the blanket "Hold and Save Harmless" resolution as signed by the public entity before undertaking any construction activities as directed by FEMA. The resolution may be obtained from the public entity by FEMA or by the Corps if directed by FEMA. A sample resolution is contained in Appendix 16 of FEMA Handbook DR&R 1.

5. FORMS OF LOCAL PARTICIPATION. In addition to the standard a-b-c requirements of local cooperation, and according to the circumstances, local participation in project work may be in the form of: contributed funds; the furnishing of materials, equipment, or services; and/or accomplishment of work either concurrently or within a specified reasonable period of time. The final, agreed upon terms will be set forth in writing and made a part of the assurance agreement before commencement of work, except as noted for Emergency Operations, Code 910-200.

a. Contributed Funds. Contributed funds will be handled as outlined in ER 1140-2-301. They may be accepted, or refunded, without further reference or approval by the CDR USACE. The required certificate of the District Commander outlined in ER 37-2-10 will cite as the pertinent authority "PL 99, 84th Congress, approved 28 June 1955 as amended."

b. Obligation of Contributed Funds. All contributed funds must be received in cash and deposited with the Treasury before any obligations can be made against such funds. Well construction is exempted from this requirement because financing is specifically authorized in PL 84-99 as amended. However, the assurance agreement must be signed in advance of any obligations. To reduce administrative problems, the agreement should be for no longer than will provide payments within the means of the applicant. The term is limited by PL 84-99 to a maximum of 30 years.

c. Provision of Work or Services in Kind. To the extent practicable, local interests should be allowed to minimize the amount of contributed

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funds by providing equivalent work or services in kind. Such services do not include lands, easements, rights-of-way, or other items of local cooperation specifically required by Corps policy.

6. RECORDS. District records will include a consolidated report on pertinent data on local cooperation and participation and other aspects of emergency projects authorized under PL 84-99. Project estimates should not include deferred maintenance and other work when it is performed directly by local interests. However, pertinent information should be recorded in the project files.

7. TRANSFER OF COMPLETED WORK TO LOCAL INTERESTS. Completed emergency repair work under PL 84-99 will be transferred to the responsible local interests in accordance with the applicable procedures for transfer of completed local protection projects (ER 1150-2-301). Detailed instructions and suggestions relative to proper maintenance and operation usually will be furnished as a standard enclosure to a letter notifying the local interests that the work authorized under PL 84-99 has been completed. The letter must remind the local interests that they are responsible for satisfactory maintenance of the flood control works in accordance with the terms of the local cooperation agreement. If warranted, a full-scale operation and maintenance manual may be furnished. Reporting requirements placed on the local interests will vary according to organization and other circumstances. REGULAR INSPECTIONS WILL BE SCHEDULED TO VERIFY LOCAL MAINTENANCE (PER 33 CFR 208.10, ER 30-2-335, AND ER 1130-2-339) AND TO REVIEW ELIGIBILITY FOR FUTURE CORPS ASSISTANCE UNDER PL 84-99.

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PART II
NON-FEDERAL FLOOD CONTROL FACILITY
REHABILITATION ELIGIBILITY GUIDELINES

1. GENERAL.

a. Intent. The intent of these guidelines is to facilitate the evaluation of the design, construction and maintenance of non-Federal flood control facilities to determine eligibility for repair under PL 84-99. Based on its common use the word "levees" will be used in this text as a basis for comparative discussion.

b. Level of Detail. The evaluation will be made through visual observation and analysis of engineering and performance data by trained district technical staff. It is anticipated calculations performed to support the evaluation should not require extensive computational efforts. The guidelines are not intended to establish design standards for non-Federal levees, but to provide uniform procedures Corps-wide for determining eligibility under PL 84-99. The screening-level procedures outlined in this appendix should provide for a reasonable determination of the integrity of the levee for flood control purposes, in order to serve as a basis for determining eligibility for Corps assistance. If the results of the Corps study are not acceptable to the levee owner, he may choose to provide his own detailed engineering study (engineer certified) for consideration in meeting eligibility.

2. PROCEDURES.

a. General. Corps involvement with non-Federal levees normally begins the first time an owner/sponsor requests repairs under PL 84-99. To evaluate these existing levees, it is imperative that the initial eligibility investigation establish the integrity and reliability of the flood control facility supported with other key factors to determine if there is Federal interest in repairing the levee. Any levee previously repaired by the Corps will be inspected in accordance with the provisions of ER 1130-2-339 to assure that the conditions of the assurance agreement are being fulfilled by the sponsor. The information gathered will also be used in determining the eligibility of the levee for possible future Corps assistance under PL 84-99. The sponsor will be notified concerning the results of the review and be advised of any work required to keep the levee eligible for the Corps' rehabilitation program. Refer to Appendix D for a definition of project sponsor. The guidelines established in this appendix may also be used where an owner/sponsor who has not previously received rehabilitation assistance from the Corps requests an inspection to determine whether his levee meets the established eligibility criteria.

Note: Part II, is a reprint from ER 500-1-1, Appendix I.

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b. Inspection Procedure. The attached Rating Guide (Exhibit A) will be used to establish the acceptable and minimum performance levels for non-Federal levees to be eligible for the Corps rehabilitation program. The Rating Guide also provides criteria for unacceptable performance levels. This guide will be provided to all known sponsors of non-Federal levees for their use in maintaining or upgrading their projects in order to remain eligible for the Corps rehabilitation program. The inspection data will identify all areas where work is required to upgrade the levee to an acceptable performance level, and be used to establish an appropriate time period to accomplish the work. If a sponsor fails to accomplish the required work, he will be notified that his/her levee is not eligible for consideration nor rehabilitation under PL 84-99 until he advises the District Emergency Management Division/Branch that the work is completed. No further inspections will be made of a facility that is ineligible until the sponsor provides notification by letter indicating that noted deficiencies have been corrected.

c. Inspection Frequency - As specified in ER 1130-2-339.

d. Technical Evaluation: The following technical evaluation procedures are intended to establish the general capability of a non-Federal levee to provide reliable flood protection. Section I (Engineering Guide) of the Rating Guide (Exhibit A) provides a list of parameters to be evaluated during the field inspection and used in the overall technical evaluation of the levee using these procedures.

(1) General. The initial inspection of any non-Federal levee using these guidelines should be conducted by technical staff experienced in levee design, construction, maintenance and damage investigations. This inspection will assess the level of protection and reliability of the existing levee. Subsequent inspections will use general levee inspection techniques and procedures to detect changed project conditions which impact the integrity of the levee. As Built drawings should be requested from local interests. If difficulties are anticipated in meeting capability requirements for inspections, further guidance should be requested from Division or HQ USACE to meet these requirements.

(2) Economic Analysis. The inspection program will collect the key land-use data noted in the Eligibility Inspection Report Format (Exhibit B) for possible future use in determining economic justification for repairing a damaged levee section. No economic analyses are required as part of the inspection program.

(3) Hydrologic/Hydraulic Analysis.

(a) The preferred method of describing level of protection is "exceedance frequency" (20%, 10% etc) for evaluation purposes. The level of protection provided by a non-Federal levee will not be expressed in terms of average exceedance intervals. (Note: The expected probability method of determining frequencies will be used.)

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(b) Investigation procedures may include noting stream characteristics, i.e., meandering, braiding, excessive depositions, etc. Also, observation should include things that may affect future stream changes, such as; debris on bridge structures and historical changes, as related by local interest or filed news accounts of flooding events.

* (c) Source of information - Collection of data such as; high water marks, location of bench marks, bridge cross-sections, flooding, and gage information may be available through searching in-house files or contacting Local Department of Highways, County Engineers and/or US Geological Survey (USGS). Agencies within the US Department of Interior such as; the Forest Service, Bureau of Indian Affairs and the Soil Conservation Service (SCS) may be a good source of information on flooding. Also, another valuable source of information may be obtained through photographs of impacted areas through contacts with Local residents and the news media. *

(d) Flood probability estimates - Regional equations are generally the first choice for estimating peak flood flow probability, where applicable. The U.S. Geological Survey (USGS) has published information on estimating the probability of floods in ungaged locations. These documents are available to provide a simple means of obtaining flood probabilities that are essentially unaffected by changes in the watershed, conveyance, storage, or runoff characteristics for natural ungaged sites. A list of these publications is attached as Exhibit C for reference. The USGS also has flood probability data on its computer system for gaged locations. Regional equations and other types of relationships, rather than the USGS information may be used. Watershed modeling may be done if necessary, because the watershed characteristics have been altered, etc.

(e) Water surface profiles - Available data and/or profiles based on known water surface and flow information are generally the first choice. However when water surface profiles are not available and simple procedures, such as end area slope, are not applicable the profiles can be computed with cross-sections and roughness values and computer programs such as HEC-2. Roughness values can be estimated from field inspection and photographs of the channel and overbank areas taken within the last 12 months. Cross-sections can usually be developed using available aerial photos, topographic maps and from overbank and channel section surveys gathered by inspectors. Other information e.g., levee location, distances, floodplains and historical highwater marks are also needed for hydrologic study.

(f) Erosion control. Each inspection will document the effectiveness of existing erosion control features, and/or the need for protection against erosion, in areas being threatened by wind waves, stream or surface flows, including erosion around appurtenant structures. Inspector(s) knowledgeable in bank protection, sediment transport, river morphology and generally familiar with the region, should be enlisted for this inspection.

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(4) Geotechnical Analyses.

(a) The geotechnical evaluation will be based primarily on a detailed visual inspection using the parameters provided in Section I of the rating guide. Hand-auger samples should be taken as determined necessary by the geotechnical evaluator, who will then decide how extensive the analysis should be.

(b) Slope Stability. The initial inspection should identify critical areas where levee stability appears weakest and document the location, reach, and cross-section at these points. Appropriate monitoring and evaluations should be recommended to document changes at these locations. Immediate monitoring of new areas which become suspect because of erosion or movement of the embankment, should also be recommended. The following cross-section template data is provided as a guide for initial visual inspection analysis.

<u>Levee Material</u>	<u>Riverward Side-Slope</u>	<u>Landward Side-Slope</u>	<u>Maximum* Height</u>	<u>Top Width</u>
Clay	IV on 2H	IV on 2H	12 feet	8 feet
Sand	IV on 3H	IV on 4H	15 feet	10 feet

*Flatter side-slopes may be required if levee height exceeds these values.

(c) Seepage: It is recognized that to obtain most favorable seepage condition data the inspections should be conducted coincident with high river stages. For better evaluation of embankments with excessive seepage or "piping" the Rating Guide should be used along with high river stage inspections.

(5) Maintenance. The Maintenance Inspection Guide (MIG) (Exhibit A, Rating Guide Sec II) is intended for use in evaluating maintenance performance and deficiencies to the same scope and degree as is required to determine compliance with assurance agreements entered into pursuant to 33 (CFR) 208.10. The data requested in the MIG should reflect the level of maintenance required to insure intended degree of flood protection and performance of local cooperation for a levee to remain eligible for the rehabilitation program under PL 84-99. The MIG is also applicable to levees where no assurance agreement exists (i.e., not previously repaired under PL 84-99), but where an eligibility review and/or reinstatement of eligibility is requested by the sponsor/owner of an existing levee.

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* e. Evaluation of Eligibility Based on the Rating Guide: The current definitive condition of the Flood Control Levee System will be evaluated using the Rating Guide (Exhibit A) as a basis. The following table provides general guidance on appropriate inspection recommendations based on the Rating Guide parameters: *

<u>Condition</u>	<u>Recommendation</u>
A- Acceptable	No immediate work required.
M - Minimally Acceptable	A deficient condition exists which needs to be improved by the levee owner. The inspector's evaluation should address the impacts on the original design and/or operation deficiencies resulting from the condition identified. Refer to Chapter 5 of ER 500-1-1 for guidance concerning, impact of deficient maintenance on eligibility for rehabilitation work.
U - Unacceptable	Items which fall within this category may render the levee ineligible for rehabilitation under PL 84-99 unless immediate corrective action is taken by the Sponsor/owner. The inspectors' evaluation should establish specific time periods within which the unacceptable performance items must be upgraded to at least Condition M. The Emergency Management Division/Branch should notify the local authorities of the potential hazards of this condition. *

* If the owner does not comply with the recommendation for correction of Condition "U" items within specified time frames, he will be notified that his levee is ineligible for repair under PL 84-99 until he corrects these deficiencies. No further inspections will be made until the owner notifies the District (Emergency Management Division/Branch) that such work has been completed. *

* f. Inspection Report Format. The format at Exhibit B is suggested for use in documenting eligibility inspection results. This format may be adapted to suit specific district needs. The PROJECT INFORMATION section, should be completed using the best data available through research of past records, visual observations during the field inspection, and detailed discussions with the sponsor/owner. The FIELD INSPECTION, EVALUATION and RECOMMENDATION sections should be completed as noted above. *

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3. REHABILITATION INVESTIGATIONS. The inspection program outlined in this appendix is intended to facilitate the completion of rehabilitation investigations when levees in the program are damaged by flood. The most recent inspection report should provide most of the general information required for the letter report (Appendix G of ER 500-1-1), to be supplemented primarily with new data on the specific flood event, related levee damage and cause of failure, repair alternatives, and economic justification for the recommended repair scheme.

For levees not in the inspection program which are damaged for the first time, see Chapter 5, paragraph 5-7d. for eligibility procedures.

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PL 84-99 RATING GUIDE

SECTION I ENGINEERING GUIDE

INSPECTION ITEM (A) ACCEPTABLE LEVEL

(M) MINIMUM ACCEPTABLE LEVEL

(U) UNACCEPTABLE LEVEL

1. Levee Seepage Evidence of minor seepage. No piping, sloughing of landside slope, with no impact on structure. Evidence of controlled localized seepage, in the form of small boils piping or sloughing of slope. Evidence of excessive uncontrolled seepage (large boils), piping, and/or sloughing of the landside slope of levee.
2. Slope Stability No slides present; No conditions present which could potentially cause slope stability problems. Minor correctable surficial sliding present that does not threaten levee's ability to perform at "design" water surface elevation. Levee cross-section generally meets the guidelines of this Appendix (para 2d(4)(b)). Evidence of deep seated slide which threaten levee integrity. Levee will not withstand "design" water surface elevation. Levee cross-section is inadequate and deficiencies previously noted have not been corrected.
3. Level of protection exceed-
ance frequency in % chance (year event) 3 ft. of freeboard). Levee provides protection against a 20% to 10% chance (5 yr. to 10 yr. event) (with 1-3 ft. freeboard). Levee provides protection 20% chance (5 yr. event) (with less than 1 ft. of freeboard) is less than 3 ft. in height.
4. Bank Protection (riprap, revetment, etc.) Slope & toe and channel bank, and foreshore protection. Sufficient erosion protection exists for all levee reaches subject to impinging high velocity river flows or wave action. This includes areas where meandering flows are causing river bank caving that could threaten levee integrity in the foreseeable future. Erosion activity present which threatens levee integrity, causing turbulent flows resulting with sediment deposition, meandering, or shoaling. Unprotected levee reaches are showing signs of progressing erosion, and inadequate or no slope or foreshore exists. Deficiencies previously noted have not been corrected. History of this river shows tendency to meander such that the levee integrity could likely be threatened in the foreseeable future.

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SECTION II MAINTENANCE INSPECTION GUIDE

INSPECTION ITEM	(A) ACCEPTABLE LEVEL	(M) MINIMUM ACCEPTABLE LEVEL	(U) UNACCEPTABLE LEVEL
PART A - LEVEE EM- BANKMENT			
* 1. Levee Depressions	Minimal depressions or pot-holes; proper drainage.	Some depressions that will not pond water.	Depressions 6" vertical or greater with water ponded. *
* 2. Levee Surface Erosion with Inspection Access.	No erosion of levee crown or slopes.	Erosion of crown that will not interfere with patrol access.	Erosion of crown that has interrupted patrol or maintenance access. *
3. Slope Stability	No slides present, or erosion of slopes more than 4" deep.	Minor surfacial sliding that with deferred repair does not pose an immediate threat to levee integrity.	Evidence of deep seated slide (2 ft vertical or greater) requiring repairs to re-establish levee integrity.
4. Animal Burrows	Continuous animal burrow control program that eliminates any active burrowing in a short period of time.	Animal burrows present that will not result in seepage or slope stability problems.	Animal burrows present that would result in possible seepage or slope stability problems.
* 5. Unwanted Levee Growth	No large brush or trees exist in the levee Section.	Minimal tree (2" Dia. or smaller) and brush cover present that will not threaten levee integrity. (NOTE: Trees that have been cut and removed from the levee should have its roots excavated and the cavity filled and compacted with granular material).	Tree, weed & brush cover exists in the levee requiring removal to reestablish or ascertain levee integrity. (NOTE: If significant growth on the levee exists, prohibiting rating of other levee inspection items, then the inspection should be ended until this item is corrected.) *

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SECTION II (Con't)

INSPECTION ITEM	(A) ACCEPTABLE LEVEL	(M) MINIMUM ACCEPTABLE LEVEL	(U) UNACCEPTABLE LEVEL
6. Encroachments	No trash, debris, excavations, structures, or other obstructions present.	Trash, debris, excavations, structure, or other obstructions present or inappropriate activities occurring that will not inhibit levee operations and maintenance performance.	Trash, debris, excavations, structure, or other obstructions present or inappropriate activities that would inhibit levee operations and maintenance performance.
PART B - CHANNEL/ FLOODWAY			
1. Riprap/Revetment Protection-Riverward Levee Slope & Toe, and Channel Bank.	Existing erosion protection works which is properly maintained and undamaged.	No scouring activity that could undercut bank or erode levee or could restrict desired channel flows.	Meandering and/or scour activity that is undercutting bank or eroding levees, or impairs channel flows by causing turbulence, meandering or shoaling.
2. Channel/Floodway Capacity.	Full channel capacity insured through next projected flood event by performed advance removal of debris, sand/silt deposits or other obstruction including unwanted vegetation beyond full capacity dimensions.	Channel capacity not affected by existing debris, sand/silt deposits, or other obstructions; however, advance removal of debris has been recommended to deter any loss of full capacity from debris accumulation.	Channel obstructions have impaired the floodway capacity and hydraulic effectiveness, with no proposed maintenance planned.
PART C - STRUCTURES			
1. Movement of Concrete Floodwalls, Headwalls & Aprons	Tilting, sliding or settling of structures, that has been secured which preserves the integrity or performance.	Uncorrected sliding or settlement of structures of a magnitude that doesn't affect performance.	Tilting or settlement of structures that has resulted with a threat to the structure integrity and performance.

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SECTION II (Con't)

INSPECTION ITEM	(A) ACCEPTABLE LEVEL	(M) MINIMUM ACCEPTABLE LEVEL	(U) UNACCEPTABLE LEVEL
2. Concrete Surfaces	Negligible spalling or scaling. No cracks present that are not controlled by reinforcing steel or that might cause integrity deterioration or result in inadequate structure performance.	Unrepaired spalling, scaling, and cracking present but immediate integrity or performance of structure not threatened.	Unrepaired surface deterioration or deep, uncontrolled cracks present that result in an unreliable structure.
3. Structural Foundations.	No scouring or undermining near the structures.	Scouring near the footing of the structure but not close enough to impact structure stability during the next flood event.	Unrepaired scouring or undermining at the foundation which has impacted structural integrity.
4. Culverts.	a) No breaks, holes, cracks in the culvert that would result in any significant water leakage. No surface distress that could result in permanent damage. b) Negligible debris or silt blocking culvert section. No or minimal debris or sediment present which have a negligible affect on operations of the culvert.	Culvert integrity not threatened by spalls, scales (concrete) or surface rusting. Cracks are present but resultant leakage is not impacting the structure. Debris or sediment present, which is proposed to be removed prior to the next flood event, that minimally affects the operations of the culvert.	Culvert has deterioration such as: surface distress and or has significant leakage in quantity or degree to threaten integrity. Accumulated debris or settlement which has not been annually removed and severely affects the operations of the culvert.
5. Gates.	Gates open easily and close to a tight seal. Materials do not have permanent corrosion damage and appear to have historically been maintained adequately.	Gates operate but leak when closed, however, leakage quantity is not a threat to performance. All appurtenances of the facility are in satisfactory condition.	Gates leak significantly when closed or don't operate. Gates and appurtenances have damages which threaten integrity and/or appear not to have been maintained adequately.

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SECTION II (Con't)

INSPECTION ITEM	(A) ACCEPTABLE LEVEL	(M) MINIMUM ACCEPTABLE LEVEL	(U) UNACCEPTABLE LEVEL
PART D PUMPING PLANTS			
1. Pumps and Motors	All pumps and motors are operational. Preventive maintenance is occurring and system is periodically subject to performance testing.	All pumps are operational and minor discrepancies are such that pumps could be expected to perform through the next projected period of usage.	Pumps are not operational, or noted discrepancies have not been corrected.
2. Power	Adequate, reliable, and enough quantity to meet demands based on historically highest projected consumption.	Adequate, reliable source to meet average historical high demands of next projected period of consumption.	Power source insufficient, historically unreliable to sustain operations during next projected period of consumption.
3. Petroleum, Oil and Lubricants (POL)	POL available on site for pumps and/or motors in quantity to meet needs of next projected service event period.	POL available within 24 hrs. or enough quantity stored to meet needs of next anticipated service event.	POL not available within 24 hrs. and/or insufficient storage to meet the needs of any service event.
4. Pump Control System	Operational and maintained free of damage, corrosion, or other debris.	Operational, with minor discrepancies.	Not operational, or incorrect noted discrepancies.
5. Pipe Embedded Metal, Trash Racks and Gates	All metal parts protected from permanent damage from corrosion. Trash racks free from damage and debris and are capable of being cleared, if required, during operation. Gates operable.	Corrosion on metal parts appears maintainable. Trash racks free from damage and minimum debris present and are capable of being cleared, before next flood event or during operation. Gates operable.	Metal parts need replacement. Trash racks damaged, have accumulated debris that have not been cleared annually or cannot be cleared during operation.
6. Sump	Clear of debris and obstructions, and mechanisms are in place to maintain this condition during operation.	Clear of large debris and minor obstructions present and mechanisms are in place to deter further accumulation during operation.	Large debris or major obstructions present in sump or no mechanism exists to prevent debris accumulation during operation.

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SUGGESTED ELIGIBILITY INSPECTION REPORT FORMAT

1. ELIGIBILITY INFORMATION

Name of Applicant/Requester: _____

River or Stream where levee is located: _____

City, County, and State where levee is located: _____

Owner: _____ Address: _____ Phone: _____

Sponsor: _____ Address: _____ Phone: _____

Name of Contact: _____ Phone: _____

2. INTRODUCTION

a. Authority: Public Law 84-99

b. Purpose Reason and Scope of Inspection

3. PROJECT INFORMATION

a. Basic Data:

(1) District Project Identification Number: _____

(2) Previous repair by other Government Agency: Yes _____ NO _____

If so, Who? _____ When? _____

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(3) River Basin: _____ Levee or Drainage District: _____

(4) River or Creek Bank: (Left) or (Right) Descending _____

b. Classification:

(1) Project Purpose(s): (flood control, land reclamation, etc.)

(2) Primary: (Yes, No) _____

(3) Secondary: (Yes, No) _____

Landward or Riverward of Primary Levee?: _____

(4) Incomplete/Abandoned: _____

(5) Other: _____

C. Protection Provided:

(1) Design

(a) General: Height _____ Top Width _____

Side-slopes (WS) _____

(LS)

(b) Estimated Level of Protection: 20% (5 yr), 10% (10 yr),
2% (50 yr), etc.

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(Based on procedures outlined in this appendix). _____

(c) Gage data if available: _____

(d) Type of Materials: _____

(e) Erosion Protection: _____

(f) Interior Drainage: _____

(2) Economic

(a) Total acres protected: _____

(b) Land use: _____

(Note): Data gathered should include % of each type of
crop of total land protected addressing per/acre value of
each crops should flooding occur without levees.

(c) Cropping Pattern: _____

(d) Value of property protected: _____

(e) Facilities protected: (e.g., Homes, businesses, industry,
(etc.)

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(f) Historic flood damage: Year _____ Amount \$ _____

Freq of Event _____

(g) Other: _____

4. FIELD INSPECTION

Briefly summarize the physical condition of the flood control system and current ability to provide dependable flood protection based on the Rating Guide. Describe any pertinent observations of the floodway/channel characteristics, including areas upstream and downstream from the levee being inspected.

Names of Inspector(s): _____

5. EVALUATION

a. Structural and Geotechnical

(1) General description of levee embankment features.

(2) Foundation Condition.

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- (3) Stability & Seepage. Briefly discuss pertinent information such as design, construction and operating records. Assess stability under maximum loading on basis of available data, together with observations during filed inspection and results of any additional, brief calculation performed by inspectors.

b. Hydrologic and Hydraulic.

- (1) Level of Protection. briefly describe available recorded information such as hydrologic and hydraulic design data, flood of record, and previous analysis. Describe any hydraulic and hydrologic analyses made for this inspection. Present conclusion with respect to adequacy of levee to provide a minimum level of protection (based on Appendix I and Rating Guide) without overtopping.

*

*

- (2) Erosion Protection. Describe existing erosion protection (type, size, etc) and briefly assess the need for additional erosion protection for any portions of the levee, or relocation of protection based on visual observations. Gather historical information of protection damage and causes, including river characteristics.

- c. Operation and Maintenance. The quality of maintenance should be assessed in order to ensure that essential maintenance work is performed and that the flood protection structure and facilities will operate as intended.

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6. RECOMMENDATIONS

Based on the results of the field inspection and evaluation, describe the work that must be performed by the owner to be in compliance with these guidelines and to be considered for eligibility under PL 84-99. The specific ratings for each item should be applied to the evaluation as noted above.

SIGNATURE OF CONCURRENCE, OF THE LEAD INSPECTOR _____

7. ATTACHMENTS

a. Completed Rating Guide.

b. Illustrations, Maps, Photos.

(1) Include a map showing location of the levee. USGS quadrangle sheet can be used to show the topography of the area location of the levee unless a more detailed topographic survey is available.

(2) If possible, include a plan and section of the levee. A field sketch should be made as a minimum.

(3) Photographs of the levee and channel should be included and referenced to the plan. In particular, color photographs of deficiencies should be included.

(4) Air photos (uncorrected and not to scale are acceptable).

Recent and past photos may be obtained through the U.S.

Department of Agriculture (USDA).

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CHAPTER 6 EMERGENCY WATER SUPPLIES AND DROUGHT ASSISTANCE

SECTION I, Emergency Water Supplies

6-1. GENERAL. Emergency Water Supplies is usually limited to providing clean drinking water when supplies are contaminated by such causes as deliberate, accidental or natural. The Corps of Engineers role in providing emergency supplies of clean drinking water is temporary until the locality is able to assume its responsibility.

SECTION II, Drought Assistance

6-2. GENERAL. Drought Assistance is usually limited to the transportation of water and construction of well to assist the drought distressed area when an imminent danger of and inadequate supply of water exist.

6-3. PROCEDURES AND GUIDANCE. Detailed procedures and guidance are provided in ER 500-1-1.

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CHAPTER 7
ADVANCE MEASURES

7-1. GENERAL. Advance Measures are those measures undertaken prior to imminent danger from flooding or a flood fight for the purpose of protecting against loss of life and damages to urban and public property. A request for assistance must be signed by the Governor of the State addressing the State's commitments and capabilities. Corps of Engineers effort will be temporary in nature only.

7-2. PROCEDURES AND GUIDANCE. Detailed procedures and guidance are provided in ER 500-1-1.

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CHAPTER 8 HAZARD MITIGATION

8-1. GENERAL. The Office of Management and Budget (OMB) issued a memorandum (dated 10 July 1980) that directed 12 Federal agencies, which presently have disaster recovery authority, to cooperate in establishing an Inter-agency Agreement for Nonstructural Damage Reduction Measures relative to flood related disasters. The interagency agreement was completed and signed 15 Dec 1980. OMB's main intent was to consolidate the federal recovery effort in an attempt to reduce the escalating and repetitive expenditure of federal disaster recovery funds.

The interagency agreement required the establishment of Hazard Mitigation Teams (HMT) for each of the 10 federal regions a list of the federal agencies participating on the HMT is provided in ER 500-1-1. The Hazard Mitigation Team must perform within 15 days the following four basic functions:

- a. Assess the extent of damage and locate areas of particular opportunities for mitigation actions.
- b. Identify high hazard zones where federal investment to repair or replace structures and facilities should be avoided and where the relocation of people and structures should be encouraged.
- c. Identify fringe areas when federal assistance should seek to mitigate hazards by flood proofing, evacuation plans, regulations and redevelopment policies.
- d. Prepare the HMT report recommending specific recovery actions to be taken by each federal agency and non-Federal level of government.

8-2. PROCEDURES AND GUIDANCE. Additional detailed procedures and guidance are provided in ER 500-1-1.

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CHAPTER 9 CORPS ACTIVITIES FOR FEMA

9-1. GENERAL. The Federal Emergency Management Agency (FEMA) acts on behalf of the Director, with authority from the President assigned in Executive 12148. FEMA promulgates Federal Regulations, Orders, Circulars, Handbooks, and other publications containing guidance governing application of PL 93-288 (Disaster Relief Act of 1974).

9-2. PROCEDURES AND GUIDANCE. Detailed procedures and guidance are provided in ER 500-1-1.

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CHAPTER 10
PROCUREMENT DURING EMERGENCIES

10-1. GENERAL. Emergency procurement procedures shall be coordinated through the EOC. The requesting official such as: Area Engineers along with representatives from Operation, Engineering and Construction division must furnish the following data to the EOC:

- a. Type of Service
(Purchase Order or Construction Contract)
- b. Scope of Work
- c. Cost of Service
- d. Duration of Service
- e. Justification of Service
- f. Who will perform service

10-2. PROCEDURES AND GUIDANCE. Detailed procedures and guidance are provided in ER 500-1-1 and in the Federal Acquisition Regulation (FAR) along with supplements thereto.

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CHAPTER 11 PUBLIC AFFAIRS

11-1. GENERAL. A public affairs officer shall assist the EOC in keeping the media informed on what type of assistance the Corps of Engineers is providing during emergency operations or other natural disaster activities and on Post-Disaster recovery work.

11-2. PHOTOGRAPHIC COVERAGE OF EMERGENCY OPERATIONS. In a letter from LMVCO-E/LMVPA dated 12 July 1983, with attachments, it is requested that the following data be furnished:

Request in duplicate, photographic documentation of future disasters. These actions should be coordinated between emergency management and public affairs elements with one copy of video tapes with a narrative description sent directly to USACE and LMVPA and two copies of photographs and 35 mm slides to LMVPA.

11-3. PROCEDURES AND GUIDANCE. Detailed procedures and guidance are provided in ER 500-1-1.

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CHAPTER 12
PRESERVATION OF ORDER

12-1. GENERAL. The SLD Security Manager will coordinate activities related to the preservation of order in a distressed area.

12-2. POLICY. The SLD Security Manager will recommend to the District Commander the options for law enforcement agencies required to provide an acceptable degree of security for Government property and unobstructed development or employment of Corps of Engineers personnel.

12-3. OPERATIONS. The SLD Security Manager will contact the law enforcement agencies selected and request their assistance and coordinate their efforts to provide and guarantee the security for property and for Corps of Engineers personnel.

12-4. PROCEDURES AND GUIDANCE. Detailed procedures and guidance are provided in ER 500-1-1.

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CHAPTER 13
NATIONAL OIL AND HAZARDOUS
SUBSTANCES POLLUTION CONTINGENCY PLAN

13-1. GENERAL. See District regulation DR 500-1-4, "Oil and Hazardous Incident Response Contingency Plan", bound under this cover titled "Natural Disaster Response Plans".

13-2. PROCEDURES AND GUIDANCE. Detailed procedures and guidance are provided in ER 500-1-1.

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APPENDIX A

PART I

RESPONSIBILITIES AND FUNCTIONS

PL 84-99

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A-1. RESPONSIBILITIES AND FUNCTIONS. The following discussion outlines the responsibilities and functions and specific duties of the key individuals of the District Emergency Organization during several phases of flood fight activities. This discussion is intended as a guide to the plan of action during the flood emergency, but should not be construed as limiting the activities to those shown here.

a. District Executive Office.

(1) Notification Phase. When a potential flood condition is predicted in the St. Louis District, the District Commander will declare the probable flood fight to be in a Notification Phase. After being informed of the flood potential by Chief of the Emergency Management Branch, he shall:

(a) Assume command of the situation and advise the Chief of Operations Division to activate the EOC.

(b) Review the District's flood emergency plan.

(c) Call a meeting of the Chiefs of the Engineering, Construction and Operations Divisions and responsible staff for the purpose of analyzing and evaluating available information pertaining to the Flood Prediction.

(d) Activate the Flood Emergency Organization.

(e) Advise Division Commander of an impending flood emergency, through the EOC.

(2) Phase I - Activation. The following functions will be performed by the District Commander unless specifically delegated by him to a subordinate.

(a) Contact and establish coordination with the Red Cross and other publicly recognized relief and rescue organizations and the concerned Governor and state agencies.

(b) Approve requisitions for special equipment or supplies requested by or through the Chief, Operations Division.

(c) Advise the Division Commander that Phase I is in effect and arrange for the possible use of facilities and services of other installations under command of Army Commanders.

(d) Assure that reports to higher authority, required by ER 500-1-1, are prepared and submitted by the EOC or the Chief, Emergency Management Branch.

(e) PAO shall be activated in accordance with Chapter 11 of ER 500-1-1.

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(3) Phase II - Flood Fighting. The District Commander shall:

- (a) Advise Division Commander that Phase II is in effect through the EOC.
- (b) Coordinate the operations of the flood emergency organization.
- (c) Coordinate supplemental aid and action taken on requests for assistance in directing flood fights with other publicly recognized relief and rescue organizations, such as the Red Cross.
- (d) When St. Louis District resources for relief, rescue, and aid are exhausted, make requests to LMVD for the use of troops from Army installations.
- (e) Approve reports to higher authority.
- (f) Prepare formal statements to news media when called upon.

(4) Recession Phase. The District Commander shall:

- (a) Advise Division Commander that all is clear, through the EOC.
- (b) Assure that there is no relaxation of patrolling or flood fighting measures until the stream recedes to bank full stage.
- (c) Prepare arrangements for the return of personnel, troops and borrowed equipment to their original assignments and for the return of equipment or supplies loaned to other districts or agencies by the St. Louis District.

b. Operations Division.

(1) Notification Phase. The Chief of the Emergency Management Branch shall:

(a) Activate the EOC, Room 1040, Emergency telephone Nos. 314-263-5200 through 263-5209, to coordinate flood emergency operations, and maintain a flood log and situation reports as necessary. This office shall be the center for dispatching information about the flood situation as it develops. Calls for information and assistance and other calls pertinent to the situation received by other offices shall be relayed to this EOC for further action. Activate the District Radio Net, as necessary.

(b) Acting as the Chief EOC, notify area engineers involved, who in turn will alert their sector engineers. Instruct area engineers to alert officials of levee and drainage districts, local Governments and agencies, and other local interests. Direct establishment of liaison with interested

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Government and private agencies to acquire and issue information on the developing flood situation. An alert notification list should be maintained and used.

(c) Secure information on field organization and facilities, and other data required, from area engineers and report to LMVD on activation of the EOC.

(d) Prepare work orders for flood emergency operations.

(e) Check supplies and equipment owned by "Disaster Preparedness Program".

(f) Instruct the Personnel-in-charge of Logistics, to make a check of District equipment that could be made available for flood fighting purposes and check the availability of commercial and private transportation facilities with Transportation and Maintenance Branch, Logistics Management Office.

(g) Keep the District Commander and Deputy District Commander advised.

(h) Establish liaison with Engineering Division, Construction Division, Planning Division and other staff elements to keep other interested offices abreast of the developing situation.

(2) Phase I - Activation. The Chief of the Emergency Management Branch shall:

(a) Notify Area Engineers, Engineering Division, Construction Division and Planning Division that activation has been ordered. Personnel on construction projects should be notified of impending flood conditions by Construction Division. Construction Division should establish liaison with projects and contractors in the potential flood area and discuss necessary measures to protect the projects and equipment.

(b) Coordinate with the Chief of Transportation and Maintenance Branch, to place automobiles and trucks in the District on a potential 24-hour operating basis.

(c) Maintain liaison with local interests and depending upon the predicted magnitude of the impending flood, advise them to close openings in local protection projects and to start patrolling activities.

(d) Place all plant and physical resources of the District on a standby basis and prepare requisitions for needed supplies, transportation, and equipment. Arrange through the Comptroller for requests to higher authority for authority to obligate funds for flood fighting and rescue work.

(e) Obtain "situation" reports from area and sector engineers and furnish information to the Situation Reports Officer for use in preparing flood situation reports.

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(3) Phase II - Flood Fighting. The Chief of the Emergency Management Branch shall:

(a) Direct field forces in emergency operations, with first emphasis on the protection and maintenance of Government works and property but also assisting or assuming full responsibility for the protection of other property when it has been demonstrated that local interests can no longer cope with the situation and when they have requested assistance.

(b) Coordinate issuance of plant, trucks, automobiles, boats and other equipment to area engineers and others as required.

(c) Maintain liaison with field units of other cooperating agencies.

(d) Supplement the rescue and relief activities of local agencies, when humanitarian considerations so require, when local agencies normally responsible are unable to cope with the situation.

(e) Obtain "situation" reports from area and sector engineers and furnish information to Situation Reports Officer for use in preparing final report to higher authority.

(4) Recession Phase. The Chief of the Emergency Management Branch shall:

(a) Assure that area and sector engineers and other field personnel remain alert until all streams have receded to bank full stage and all danger of further flooding has passed.

(b) Coordinate with the EOC the return of equipment and supplies to their normal destinations.

(c) Obtain from area and sector engineers a final report on flood damages, needed repairs, and an estimate of work and cost to make repairs.

c. Engineering Division.

(1) Notification Phase. The Chief of the Engineering Division shall:

(a) Direct the following activities of the Hydrologic and Hydraulics Branch:

1 Recognition of flooding potential and advising the Chief, Operations Division, of flood conditions.

2 Preparation of a flood potential report in conjunction with Situation Reports Officer for transmission by TWX to USACE and appropriate key Federal, state and local officials as the situation merits.

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3 Lake level regulation and processing other matters pertaining to the impending flood.

4 Collection, analysis and dissemination of data used to predict peak stages and dates at all known critical flood locations.

5 Development of plans for staffing the Hydrologic and Hydraulics Branch, Water Control Management Section, for 24-hour service during the emergency.

(b) Establish liaison with appropriate Governmental and private agencies for the collection of flood data.

(c) Furnish available copies of maps, charts, and other data pertinent to flood fighting for use by members of the District Emergency Organization and others engaged in flood emergency operations.

(d) Keep the District Commander and Deputy District Commander advised of flood conditions.

(2) Phase I - Activation. The Chief of the Engineering Division shall:

(a) Continue arrangements for 24-hour operations of Hydrologic and Hydraulics Branch, Water Control Management Section, and as required, assign other personnel from the Engineering Division to flood emergency duties.

(b) Relieve from their normal duties and turn over to the Chief of the Emergency Management Branch, such personnel as may be available and required for Flood Fight assignments.

(c) Continue and if necessary step up liaison with the appropriate Government and other agencies for collection of flood data.

(d) Direct the operation of Lakes in preparation for the impending flood, in accordance with regulation procedures prescribed by the Hydrologic and Hydraulics Branch, Regulating Section.

(3) Phase II - Flood Fighting. The Chief of the Engineering Division shall:

(a) Continue liaison with other agencies to obtain flood data.

(b) Direct preparation of and approve special reports requested by higher authority or other agencies.

(c) Direct the operation of lakes for flood control purposes.

(d) Act as adviser to the District Commander.

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(4) Recession Phase. The Chief of the Engineering Division shall:

(a) Continue Phases I, II and other duties until no longer required.

(b) Direct the return of Engineering Division personnel and equipment to normal assignments.

d. Construction Division.

(1) Notification Phase - The Chief of the Construction Division shall:

(a) Notify Resident/Project Engineers that the possibility of a flood threat is imminent and that all Emergency Plans for the protection of civil work construction projects are implemented.

(2) Phase I - Activation. The Chief of the Construction Division shall:

(a) Maintain a current listing of all contractors and contract equipment being utilized in civil works activities of the District.

(b) Assumes staff responsibility for administration and inspection of contracts for emergency work.

(c) Relieve from their normal duties and turn over to the Chief of the Emergency Management Branch such personnel as may be available and required to perform Flood Fight assignments.

(3) Phase II - Flood Fight. The Chief of the Construction Division shall:

(a) Continue liaison with area contractors on available equipment.

(b) Act as advisor to the District Commander.

(c) Direct preparation of and approve special reports requested by higher authority or other agencies.

(4) Recession Phase. The Chief of the Construction Division shall:

(a) Continue Phases I, II and other duties until no longer required.

(b) Collect from Operations Division and other elements of the District Emergency Organization final reports and data for use in preparing summary reports.

(c) Coordinate with the EOC the return of Construction Division personnel and equipment to normal assignments.

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e. Planning Division.

(1) Notification Phase. The Chief of the Planning Division shall initiate activities for the collection of data and preparation of a post flood report.

(2) Phase I - Activation. The duties of the Chief of the Planning Division shall be essentially the same as listed in the notification phase.

(3) Phase II - Flood Fighting. The Chief of the Planning Division shall:

(a) Continue the duties outlined for Phases I and II.

(b) Direct the preparation of special reports requested by higher authority.

(c) Furnish personnel for field reconnaissance to obtain flood loss data and other information pertinent to future studies.

(4) Recession Phase. The Chief of the Planning Division shall initiate summary reports as required, collect from the Operations Division and other elements of the district emergency organization, final reports and data for use in preparing the Post-Flood Report.

* f. Office of Information Management. *

* (1) Notification Phase. The Chief of Information Management shall: *

* (a) Activate the communications center to maintain and operate the communication and messenger service on a potential 24-hour basis. (Also, see DR 500-1-2) *

* (b) Check on arrangements for room 1040 where members of the Flood Center will convene for setup of electronic and radio communications equipment in the EOC. *

* (c) Provide reproduction services, photographic and video equipment, e.g., available as the situation may require. *

* (2) Phase I - Activation. The Chief of Information Management shall: *

* (a) Staff the electronic communications support unit for the EOC. *

* (b) Provide support services for establishing electronic and radio communications. *

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* (3) Phase II - Flood Fighting. The Chief of Information Management shall:

*

* (a) Maintain communications support service, as required.

*

(b) Provide for developing and finishing photographs and video coverage taken of flood conditions.

g. Real Estate Division. The Chief of the Real Estate Division shall:

Notification through Recession Phases.

(a) Make arrangements for right-of-entry to buildings, easements to borrow areas and rights-of-way, and prepare necessary forms in connection therewith.

(b) Establish safeguards against claims insofar as it is possible without stopping important flood fighting operations whenever rights-of-way cannot be obtained by normal methods in time to be used effectively.

h. Procurement and Supply Division. The Chief of the Procurement and Supply Division shall:

Notification through Recession Phases.

(a) Procuring supplies and materials in conjunction with Emergency Operations.

(b) Assist the EOC in the location of and contracting for equipment in support of emergency operations.

(c) Provide Emergency Contract services as required.

i. Hydrologic and Hydraulics Branch. The duties of the Chief of the Hydrologic and Hydraulics Branch, as director of the Water Control Management Section and other units of the Hydrologic and Hydraulics Branch engaged in flood emergency operations, are outlined below:

(1) Notification Phase. The Chief of the Hydrologic and Hydraulics Branch shall:

(a) Notify the Chief of the Engineering Division and Chief of the Emergency Management Branch of imminent flooding conditions.

(b) Direct activities to collect all rainfall and river stage data, analyze data, and make predictions as to peak stage and data at any and all critical flood locations.

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(c) The Hydrologic and Hydraulics Branch is designated to transmit the report on flood situations to LMVD in order that pertinent discussion and decisions regarding flood predictions and lake regulations, as well as coordination between other Districts and Divisions, may be taken care of at the same time.

(d) Notify and assign additional personnel from sections within the Hydrologic and Hydraulics Branch to flood emergency duties in order that the activities of the Water Control Management Section or other flood emergency duty may, if necessary, be continued on a 24-hour basis.

(e) Review and approve reports by the Chief of the Hydrologic and Hydraulics Branch, Water Control Management Section, to higher authority.

(f) Act as adviser to the Chief, Engineering Division, in regard to proposed lake regulations and other matters pertinent to the impending flood.

(2) Phase I - Activation. The Chief of the Hydrologic and Hydraulics Branch shall:

(a) Dispatch personnel from the Hydrologic and Hydraulics Branch to the field to obtain flow measurements, crest stages, siltation data, and other hydrologic information.

(b) Keep the Chief of the Emergency Management Branch and the EOC informed.

(c) In addition to reporting to LMVD by radio or telephone, also prepare reports for submission to HQUSACE and others, through the EOC.

(d) Assist Planning Division in preparing daily estimates of flood damage as required for situation reports and other similar reports.

(3) Phase II - Flood Fighting. The responsibilities of the Chief of the Hydrologic and Hydraulics Branch shall be essentially the continuation of the previous mentioned duties.

(4) Recession Phase. The Chief of the Hydrologics and Hydraulics Branch shall:

(a) Continue lake regulations activities.

(b) Continue collection of data and other duties until the emergency has passed.

(c) Initiate and aid the Planning Division in preparing the After Action Report required by ER 500-1-1.

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j. Geotechnical Branch.

(1) Notification Phase. The Chief of the Geotechnical Branch shall:

(a) Notify the Chief, Geology Section to mobilize and check instruments and equipment for monitoring underseepage.

(b) Provide geotechnical engineering assistance as requested by the Emergency Management Branch or Flood Area Engineers related to known cases of potential levee instability.

(2) Phase I - Activation. The Chief of the Geotechnical Branch shall:

(a) Dispatch technical personnel to monitor piezometers and relief well flows.

(b) Dispatch geotechnical engineers to the field to visually evaluate embankment performance and seepage conditions, and expedite evaluation of piezometric and well data. These personnel shall coordinate their activities with area offices and provide the area office and Sector Engineers with pertinent information on conditions. Particular attention will be given to the need to increase well flow by removing standpipes, removing obstructions, or pumping.

(c) Provide geotechnical engineering expertise as needed for all situations related to potential floodwall or embankment instability.

(3) Phase II - Flood Fighting. The Chief, Geotechnical Branch shall:

(a) Increase, as necessary, staffing and hours of field monitoring personnel and field geotechnical engineers.

(b) Continue geotechnical engineering assistance.

(4) Recession Phase. The Chief, of the Geotechnical Branch shall evaluate data related to underseepage and stability conditions and the performance of underseepage controls and make recommendations to EOC and/or higher authority regarding the need for maintenance, repair, construction of additional underseepage controls, or changes in operation.

k. Flood Area Engineers.

(1) Notification Phase. The flood area engineer of a flood fight area shall:

(a) Alert the Sector Engineers and outline a plan of action for their field organization, and inform the Chief, Emergency Management Branch,

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of any change in the previously approved plan. Review project flood emergency protection plans.

(b) Establish liaison with county or local Civil Preparedness or Emergency Services Coordinator and other organizations likely to be in flood protection, rescue, relief, and rehabilitation work during the flood emergency and advise the Chief, Emergency Management Branch, of the names of these organizations and the persons in charge.

(c) Locate emergency sources of supplies and equipment locally that may be necessary for the protection of life and property.

(d) Keep the EOC fully informed. Report to the Chief, EOC by telephone, on the flood situation by 0900 hrs and 1400 hrs daily.

(2) Phase I - Activation. The flood area engineer shall:

(a) Dispatch Sector Engineers to their assigned areas. During the various phases of the flood emergency, Sector Engineers in their capacity as assistants to the flood area engineer, will perform field duties prescribed by the flood area engineer.

(b) Move necessary Government plant to predetermined locations in readiness for emergency operations, as required.

(c) Maintain liaison with local agencies and private interests.

(d) Perform reconnaissance of flood areas and determine and report to the Chief of the Emergency Management Branch on requirements for manpower, equipment, materials, transportation, and communications.

(e) Requisition necessary trucks, passenger vehicles, radio equipment, boats, outboard motors, etc., through the Chief, Emergency Management Branch.

(f) Obtain authority from the EOC or Chief of the Procurement and Supply Division for emergency procurement.

(g) Continue situation reports to the EOC at least twice daily.

(3) Phase II - Flood Fighting. The flood area engineer shall:

(a) Direct operations to protect and maintain Government installations and property, using project flood emergency protection plans.

(b) Direct the activities of sector engineers, continue liaison with local interests, and when called upon, direct technical and supervisory assistance to local interests.

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(c) Continue reports to the EOC, at least twice daily and transmit time, cost and other reports.

(4) Recession Phase. The Flood Area Engineer shall:

(a) Direct the return of personnel and equipment to normal operations.

(b) Perform a reconnaissance of area to determine flood damages to both Federal and Non-Federal property and prepare an estimate of monetary value of damages.

(c) Transmit final daily time and cost report to the EOC.

(d) Secure hydrologic data and other pertinent engineering data for use in preparing reports to higher authority.

(e) Make a final report through the Chief of the Emergency Management Branch, to the Chief of the Planning Division, and the Chief of the Hydrologic and Hydraulics Branch.

(5) Post Flood Levee Inspection. The Flood Area Engineer shall:

(a) Perform a thorough inspection of levees and appurtenant works, and riverbank when located in proximity of the protective works, approximately one week after recession of the floodwater below the toe of the levee. Such inspection should be made jointly with a member of the local levee district to provide a basis for recommendations on remedial actions necessary to insure that the levee will provide adequate protection in event of a threat by future floods.

(b) Prepare an inspection report along with recommendations for work necessary to restore the structure to its original condition.

*

1. Logistics Management Office.

(1) Notification Phase. The Chief of the Logistics Management Office shall:

(a) Check on arrangements for room 1040 where members of the flood center will convene, cancelling reservations made for other agencies.

(b) Provide office supplies, labor support and transportation.

(2) Phase I - Activation. The Chief of Logistics Management Office shall:

*

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* (a) Provide services for disposing of office supplies, vehicles and furnish labor support to Emergency Operations Center.

(b) Provides aircraft support and emergency procurement from Federal Supply Service and other Government sources.

(3) Phase II - Flood Fighting. The Chief of the Logistics Management Office shall:

(a) Provide labor support to Emergency Operations Center.

(b) Provide travel, transportation and aircraft support.

*

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APPENDIX A
PART II
RESPONSIBILITIES AND FUNCTIONS
PL 93-288

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A-2. RESPONSIBILITIES AND FUNCTIONS UNDER PL 93-288.

a. Preliminary Assessment and Damage Survey Reports. The first mission assigned is usually the preliminary field assessment. If a Presidential declaration is issued, the preparation of detailed Damage Survey Reports (DSR) is requested and work missions are assigned.

b. FEMA Directives. Detailed procedures and guidance are provided in ER 500-1-1, Chapter 9.

A-3. DETAILED RESPONSIBILITIES. A general description of the responsibilities for PL 93-288 activities (FEMA assignments) are presented in the following subparagraphs:

a. Normal Organization. Emergency operations in connection with natural disasters within the jurisdictional boundaries of the St. Louis District shall be supervised and conducted by the normal organization when directed by the Division Commander. The normal organization of the District Office is as follows:

b. District Commander. The following functions will be performed by the District Commander unless specifically delegated by him to a subordinate.

(1) Actively supervises the overall disaster operations of the District.

(2) Handles all relations with the Division Commander and higher authority.

(3) Handles problems and relations with public officials and private interests which are beyond the scope of the field area engineers.

(4) Responsible to CONUSA Commanders through the Division Commander, LMVD, for the execution of assigned missions.

(5) Issues press releases concerning the overall situation in the District.

c. Operations Division. The Chief of the Emergency Management Branch shall be responsible to the District Commander for all matters pertaining to the plans and activities both prior to and during disaster recovery operations of the St. Louis District. Personnel from other Divisions and separate Branches of this office shall be furnished to augment the disaster organization. The Chiefs of all Divisions and Branches of the District Office shall furnish such assistance as may be requested by the Chief of the Emergency Management Branch during disaster recovery operations. During disaster recovery operations the Chief, Emergency Management Branch, shall be responsible to the District Commander for:

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(1) Constant appraisal of and recommendations to the District Commander concerning critical situations.

(2) Recommendations concerning the shifting of major plant items within the District when required.

(3) Recommendations regarding personnel, equipment, material levels, and allocation of all resources.

(4) Measures being taken, and performance of special duties assigned to branches and sections within the Operations Division.

d. Emergency Management Branch. During emergencies, the Emergency Management Branch will be the nerve center of operations. This branch shall, in addition to its regularly assigned duties:

(1) Receive incoming reports, maintain records and files and prepare outgoing messages.

(2) Prepare required reports to higher authority.

(3) Prepare estimates and request funds for operational requirements.

(4) Maintain maps and other visual aids as necessary.

(5) Coordinate and follow up regarding requests for personnel, equipment and materials required by field forces.

(6) Assist Planning Division in preparing Post-Disaster Report.

(7) Establish and maintain liaison with representatives of Federal and State Disaster Preparedness Organizations, American Red Cross, U.S. Coast Guard, and other agencies with disaster responsibilities.

(8) Act as liaison between District Office and field forces for distribution of material, supplies, personnel, equipment and transportation.

(9) Prepare and conduct training in disaster activities for personnel assigned to emergency units, as directed by higher authority.

(10) Keep the staff organization informed as required.

e. Engineering Division. The Chief, Engineering Division, shall be responsible for:

(1) Preparation of engineering plans, drawings, specifications and estimates as may be required.

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(2) Establishment and maintenance of liaison with the National Weather Bureau, National Oceanic and Atmospheric Administration (NOAA) and other agencies responsible for the prediction, evaluation, and recording of floods, earthquakes, tornadoes, snow storms, ice storms, and other natural disasters.

(3) Receiving, tabulating, evaluating, and issuing meteorological and hydrological data including tornado warnings.

(4) Planning for disaster relief and recovery, providing technical assistance on methods and procedures to be employed and coordinating activities in support of the EOC on emergency work.

f. Construction Division. The Chief of the Construction Division shall be responsible for:

(1) Maintaining current listing of all contractors and contract equipment being utilized in Civil Works activities of the District.

(2) Assumes staff responsibility for administration and inspection of contracts for emergency work.

(3) Planning for disaster relief and recovery, providing technical assistance on methods and procedures to be employed and coordinating activities in support of the EOC on emergency work.

g. Planning Division. The Chief of the Planning Division shall:

(1) Plan for disaster relief and recovery operations, provide technical assistance on methods and procedures to be employed and coordinate various activities in support of the EOC on emergency work.

(2) Conduct investigations and preparation of the post-disaster report.

(3) Conduct post-disaster surveys and compile data on damages resulting from the disaster.

h. Real Estate Division. In disaster recovery operations certain legal requirements, such as "right-of-entry" and other assurances must be available prior to start of operations. Real Estate Division has responsibility for obtaining assurances from local interests. Engineering Division and Operations Division will provide technical assistance and coordinate with Real Estate to support acquisition of the required real estate interests.

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i. Procurement and Supply Division. The Chief, Procurement and Supply Division shall be responsible for:

- (1) Procuring supplies or other materials in conjunction with disaster recovery operations.
- (2) Requesting special orders delegating contracting authority to the Chief of the EOC and Flood Area Engineers, or to others, in anticipation of domestic emergency operations. (See ER 500-1-1)
- (3) Assisting the EOC in the location of and contracting for equipment in emergency operations.
- (4) Planning for disaster relief and recovery, and coordinating activities in support of the EOC on emergency work.
- (5) Provide emergency contract services as required.

j. Field Activities. Flood Area Engineers, Resident Engineers and Project Managers are responsible for:

- (1) Supervising emergency operations within designated boundaries of normal operations.
- (2) Taking immediate action under emergency conditions consistent with existing regulations.
- (3) Making an initial report to the District Commander through the EOC of any major emergency or disaster that is foreseen, occurring, or that has occurred. This report will be made by the most expeditious means of communication available.
- (4) Establishing liaison with local civil authorities in a disaster area. The District Commander may delegate authority to the Area or Resident Engineer, or to the Project Manager concerned, to act as his representative in indicating the readiness of the Corps of Engineers to render disaster assistance within its authorities and capabilities.
- (5) Making an initial determination of assistance required from the Corps, based on his estimation of the situation.
- (6) Assist in administration of contracts, inspect contract work, conduct hired labor work, and prepare progress reports and contract payment estimates.

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APPENDIX B

INTER/INTRADIVISIONAL
ASSISTANCE

B-1. INTERDIVISIONAL ASSISTANCE. This type of assistance is usually requested when the Division Commander has determined that all available resources under his command are inadequate to cope with the existing or predicted emergency mission task. This request is normally made through supporting Divisions with CDR, USACE, DAEN-CWO-E being kept abreast of the situation.

B-2. SUPPORT. Divisional support may be between the following:

Requesting DivisionSupport Division

LMVD

SAD, SWD, MRD

SAD

LMVD, ORD

ORD

LMVD, MRD, NCD

SWD

LMVD, MRD, SPD

MRD

LMVD, NCD, NPD, SWD

B-3. INTRADIVISIONAL ASSISTANCE. This type of assistance is usually requested by the District Commander to the Division Commander thru LMVCO-E. Its purpose is to obtain support from the Memphis, Vicksburg or New Orleans District or viceversa.

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APPENDIX D

OPERATION OF MAJOR FLOOD
CONTROL WORKS

D-1. GENERAL. Extensive care is taken by the Corps of Engineers (CE) in design, construction and operation of dams. As a result, the CE record for dam safety is considered excellent. Nevertheless, dam failures in the United States in recent years have focused much attention on dam safety, resulting in a requirement for all Federal Agencies to review practices affecting the safety and integrity of Federal dams. The effectiveness of a quick response to emergency conditions by the responsible individual in preventing failure is obvious. The CE is committed to a program of dam safety.

D-2. FLOOD EMERGENCY PLANS. These plans are available at each Lake Management Project and within various elements of the District Office. The following general information is provided in each plan:

- a. Emergency Identification Subplan
- b. Emergency Operations and Repair Subplan
- c. Emergency Notification Subplan
- d. Emergency Evacuation Subplan

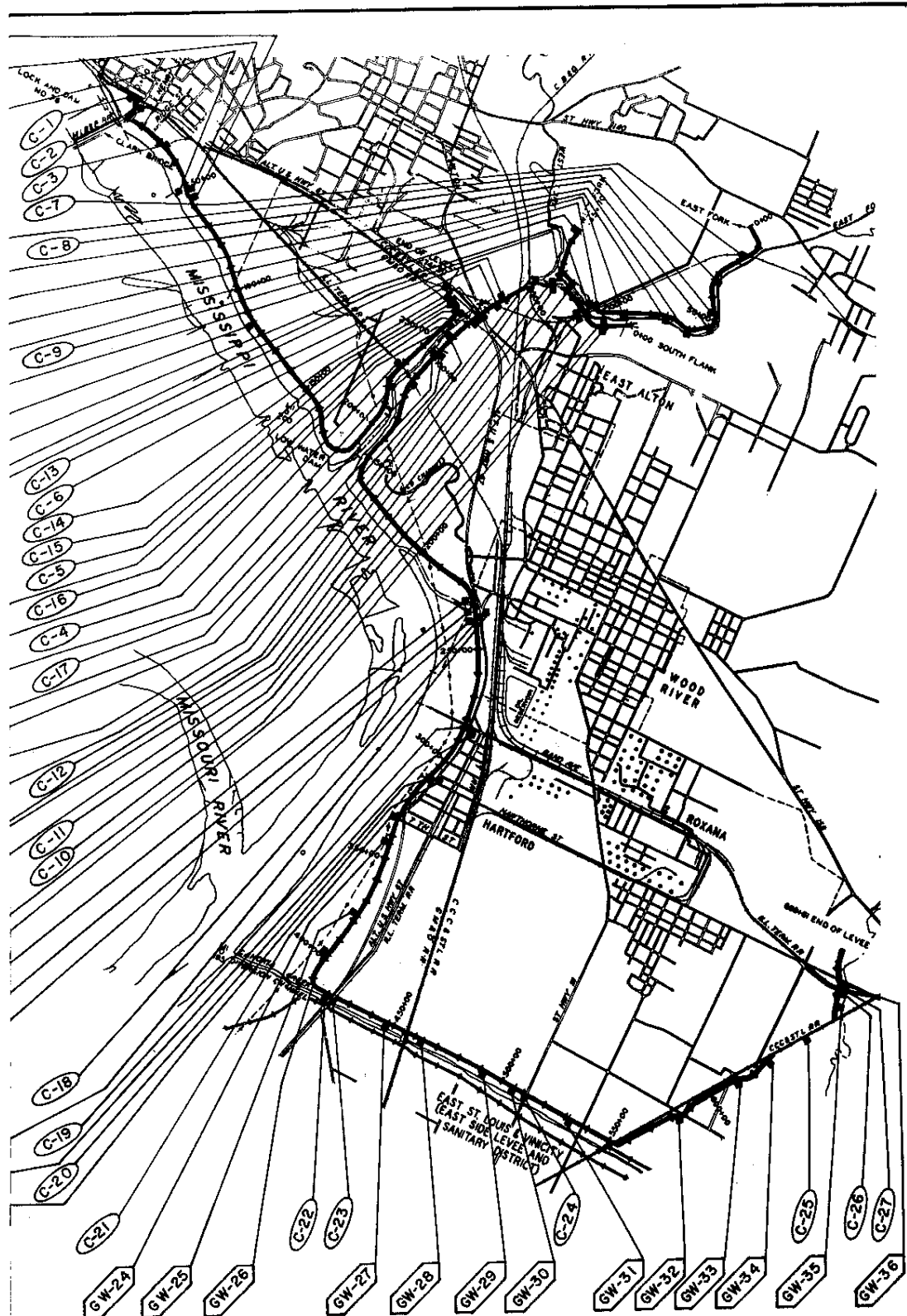
D-3. OPERATION OF FLOOD CONTROL PROJECTS. Local levee and Drainage Districts operate their own flood control works in accordance with operation and maintenance manuals provided by the Government for Federally constructed flood control works. The following listed flood control projects are considered as a major flood control works:

- a. Wood River Drainage and Levee District
- b. Metro-East Sanitary District
- c. St. Louis Flood Protection Project, Reach 3 and 4
- d. Cape Girardeau Flood Protection Project

D-4. TABLE 1, ADDITIONAL ACTIVATION PHASES AND CRITICAL STAGES FOR LEVEE DISTRICTS, BETWEEN ALTON TO GALE ILLINOIS, MISSISSIPPI RIVER.

D-5. TABLE 2, LEVEE OPENING CLOSURES, ALTON TO GALE.

U. S. ARMY



STAGE BASED ON BACKWATER. FLASH FLOOD
NS MAY REQUIRE EARLIER CLOSURE.

STAGE CONTINGENT UPON FLASH FLOOD
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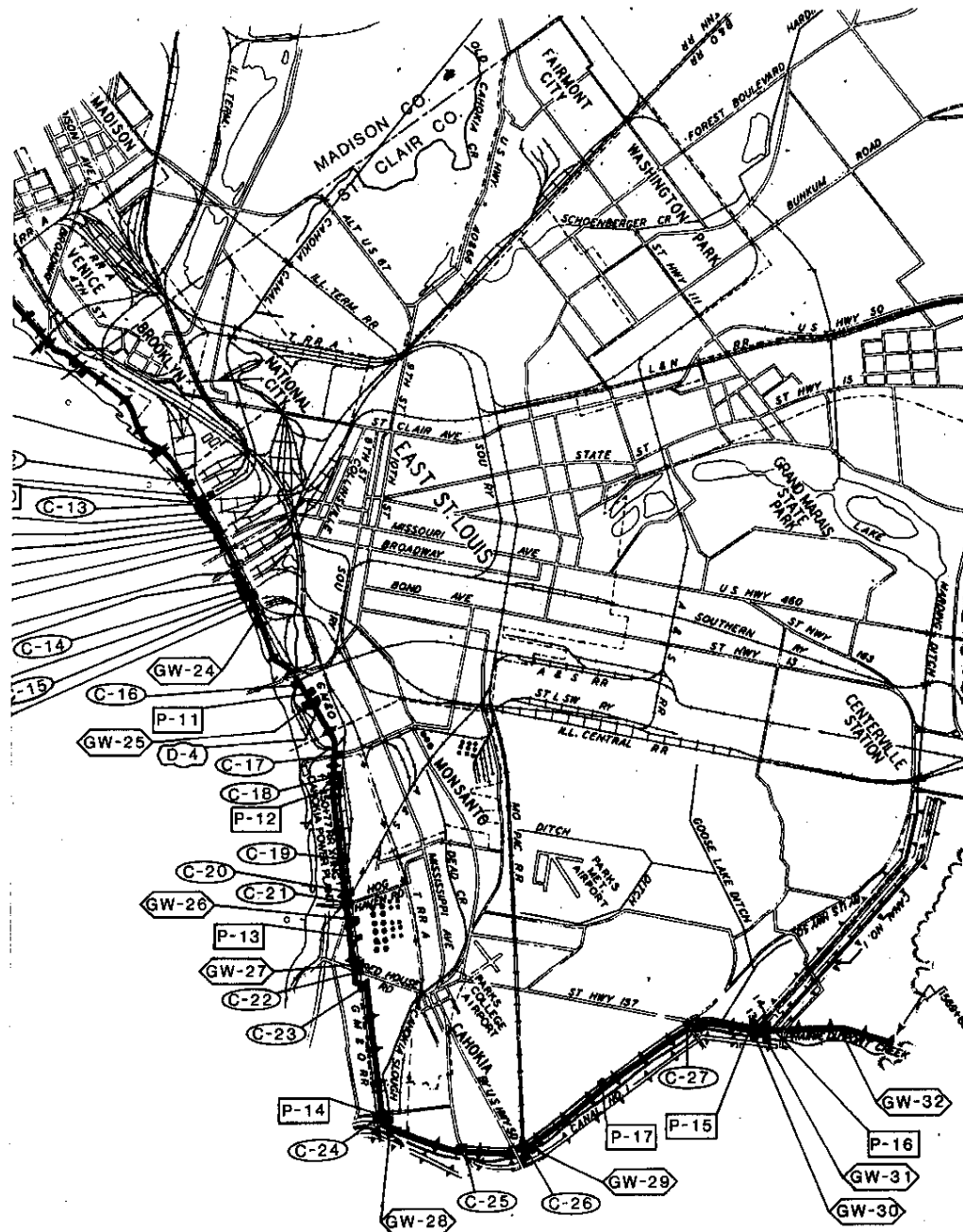
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GENERAL PLAN AND SCHEDULE OF OPERATION FOR FLOOD PROTECTION

WOOD RIVER
DRAINAGE AND LEVEE DISTRICT

PLATE NO.

U. S. ARMY



STAGE BASED ON BACKWATER FLASH FLOOD
IS MAY REQUIRE EARLIER CLOSURE.

STAGE CONTINGENT UPON FLASH FLOOD
IS ONLY.

ELEVATIONS FOR HIGHWAYS AND
S ARE SILL ELEVATIONS AND CLOSURE
MADE PRIOR TO THESE ELEVATIONS.
AS REQUIRED.

BY C.N.&V. DISTRICT PERSONNEL.

BY TSARCOM & SLASC PERSONNEL.

BY CORPS OF ENGINEERS PERSONNEL (RU-L).

ON SURFACE RUN-OFF, PRAIRIE DUPONT CREEK
MISSISSIPPI RIVER.

ON BLUE WATERS DITCH OR HARDING DITCH
PRAIRIE DUPONT CREEK.

LEGEND

—+—+—+—	LEVEE OR FLOODWALL & LEVEE
P	PUMPING STATION
C	CLOSURE STRUCTURE
GW	GATEWELL
D	DIVERSION CHAMBER
▲	CHAIN OF ROCKS CANAL STATIONING

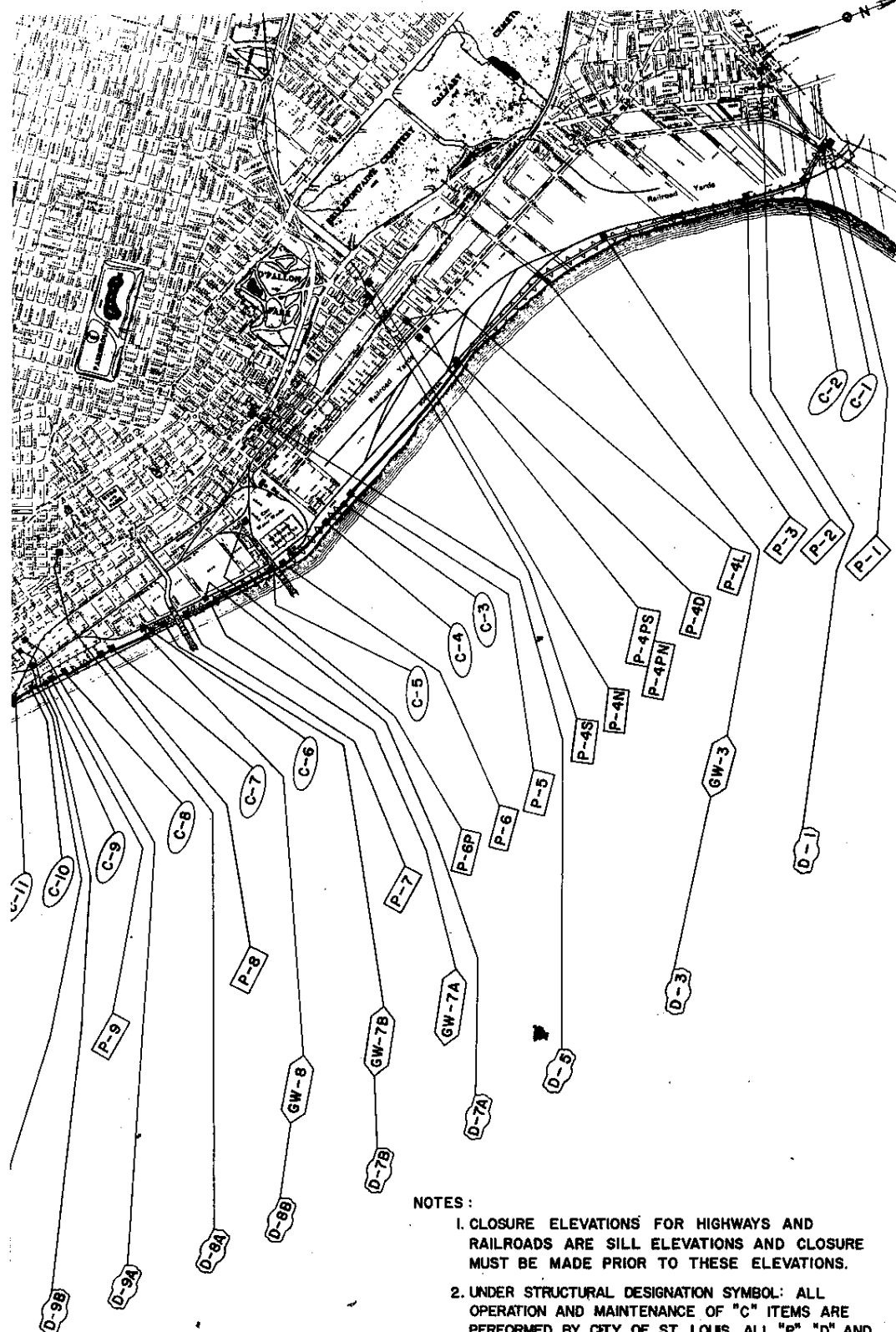
GENERAL PLAN AND SCHEDULE OF OPERATION FOR FLOOD PROTECTION

EAST SIDE

LEVEE AND SANITARY DISTRICT
ST. CLAIR COUNTY

SHEET 2 OF 2

PLATE NO.



GENERAL PLAN AND SCHEDULE OF OPERATION FOR FLOOD PROTECTION

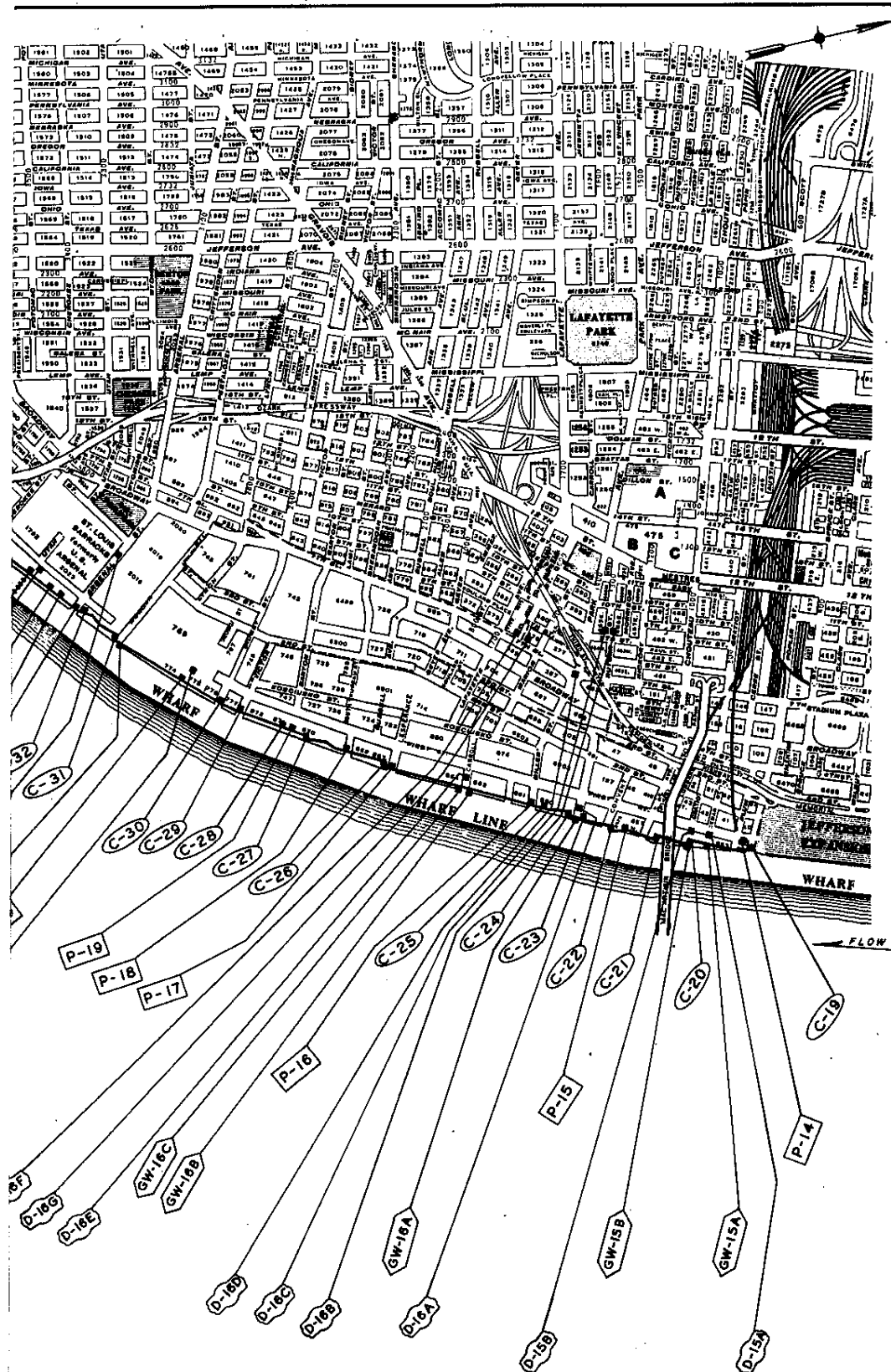
CITY OF ST. LOUIS

REACH 3

REVISION NO. 2 6 APR. 1965

PLATE NO.

U. S. ARMY



LEGEND

- FLOODWALL
- P — PUMPING STATION
- *C — CLOSURE STRUCTURE
- D — DIVERSION CHAMBER
- GW — GATEWELL

GENERAL PLAN AND SCHEDULE OF OPERATION FOR FLOOD PROTECTION

CITY OF ST. LOUIS

REACH 4

MENT

PLATE NO.

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TABLE I

ADDITIONAL

ACTIVATION PHASES AND CRITICAL STAGES FOR LEVEE DISTRICTS

BETWEEN ALTON AND GALE, ILLINOIS - MISSISSIPPI RIVER

Levee District	Gage	Levee Grade (Net)	Phase I ALERT (1)	Phase II For Flood Fight Operations (1)	Approximate Stage at Which Levee Conditions Are Likely to Become CRITICAL (2)	Approximate OVERTOPPING Stage Without Emergency Capping (3)
PRIVATE LEVEES Vicinity West Alton, Missouri	L&D No. 26 (Lower)	--	420.0	423.0	424.0	425.5
WOOD RIVER (Upper Area)	L&D No. 26 (Lower)					
River Front*		445.4	423.0	423.0	435.4	441.0
Lower Flank (Along North Bank of Wood River)		445.4	428.0	435.0	440.4	446.0
WOOD RIVER (Lower Area)	L&D No. 26 (Lower)					
Upper Flank (Along South Bank of Wood River) & River Front		445.4	428.0	435.0	440.4	446.0
Lower Flank (Along Cahokia Canal)		445.4	428.0	435.0	440.4	446.0
Lower Flank (Along NYC R.R. Emb.)		445.4	(4)	(4)	440.4	446.0
Lower Flank (Indian Creek)			Levee Subject to Flash Floods Only			
EAST SIDE	St. Louis					
Upper Flank		54.0	37.0	43.0	49.0	55.5

*(River Front & Back Levees)

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Levee District	Gage	Levee Grade (Net)	Phase I ALERT (1)	Phase II (ACTIVATION) For Flood Fight Operations (1)	Approximate Stage at Which Levee Conditions Are Likely to Become CRITICAL (2)	Approximate OVERTOPPING Stage Without Emergency Capping (3)
<u>EAST SIDE (Cont)</u>						
River Front		54.0	37.0	43.0	49.0	54.0
Lower Flank*		54.0	36.0	41.0	45.0	51.0
<u>CHOUTEAU ISLAND*</u>	St. Louis	--	32.5	35.0	37.0	39.0
<u>PRAIRIE DU PONT (Incl. FISH LAKE)</u>	St. Louis	54.0	37.0	43.0	49.0	54.0
<u>COLUMBIA</u>	Brickeys	47.7	33.0	39.0	42.7	47.7
<u>HARRISONVILLE</u>	Brickeys	47.7	33.0	39.0	42.7	48.0
<u>FT. CHARLES</u>	Brickeys	47.7	33.0	39.0	42.7	48.0
<u>STRINGTOWN-FT. CHARLES</u>	Brickeys	47.7	33.0	39.0	42.7	48.0
<u>PRAIRIE DU ROCHER</u>	Brickeys	47.7	33.0	39.0	42.7	48.0
<u>KASKASKIA ISLAND</u>	Chester	48.5	31.0	34.0	37.0	41.3
<u>BOIS BRULE DRAINAGE AND LEVEE DISTRICT</u>	Chester					
<u>DECOGNIA</u>						
River Front	Chester	48.5	34.0	40.0	43.5	49.5
Back Levee	Grand Tower	50.0	35.0	42.0	45.0	51.0
<u>GRAND TOWER</u>	Grand Tower	50.0	35.0	42.0	45.0	51.0
<u>PRESTON (5)</u>	Cape Girardeau	51.2	34.0	42.0	44.0	52.0
* (River Front & Back Levees)		48.5	34.0	40.0	43.5	49.5

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Levee District	Gage	Levee Grade (Net)	Phase I ALERT (1)	Phase II (ACTIVATION) For Flood Fight Operations (1)	Approximate Stage at Which Levee Conditions Are Likely to Become CRITICAL (2)	Approximate OVERTOPPING Stage Without Emergency Capping (3)
<u>CLEAR CREEK</u>	Cape Girardeau					
River Front (5)		51.2	34.0	42.0	44.0	52.0
Back Levee		51.2	38.0	42.0	46.2	52.0
<u>EAST CAPE GIRARDEAU (5)</u>	Cape Girardeau	51.2	34.0	42.0	44.0	52.0
<u>CITY OF CAPE GIRARDEAU--Reach 2</u>	Cape Girardeau	54.2	38.0	42.0	49.2	54.2
<u>NORTH ALEXANDER</u>	Cape Girardeau	51.2	38.0	42.0	46.2	52.0
<u>MILLER POND</u>	--	--	Levee Subject to Flash Floods Only			

(1) Applicable to Levees only.

(2) Assumed to be project net grade minus five feet, except for private and *substandard levees.

(3) Overtopping stage for tributary levees is based on "flat" backwater from main stem and does not reflect flash flood conditions. Localized conditions, such as "low" road crossings, will require work at earlier stages.

(4) Not applicable. Levee is protected by spoil bank on right bank of Cahokia Canal to a stage of about 439.0.

(5) Levees are at project grade but are considered to be substandard for lack of seepage control measures.

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LEVEE OPENING CLOSURES

ALTON TO GALE

PREFACE

1. "Elevation of Opening" is lowest elevation in opening, except where closure structures have been installed. Elevation shown for closure structures is top of base slab or cut-off wall, except as indicated by footnote.
2. "Gage Reading" shown as stage for closing opening is the approximate gage reading at which water surface will be at the elevation of the opening.
3. "Gage Reading" does not include a "time allowance" for making preparations to close opening nor for actual time required to effect closure. Actual time of closure will be governed by local conditions and predicted stages.

Levee Station	Floodwall or Levee Opening	Elevation of Opening	Stage for Closing		Method of Closure	Order of Closure
			Gage	Gage Reading		
<u>CHOUTEAU ISLAND LEVEE DISTRICT</u>						
227+37	Road Crossing	422.7	St. Louis	37.2	Sandbags	1
238+79	Road Crossing	423.0	St. Louis	37.7	Sandbags	2
274+64	Road Crossing	423.0	St. Louis	38.1	Sandbags	3
<u>WILSON AND WENKEL AND PRAIRIE DU PONT D&L DISTRICTS (INCLUDING FISH LAKE)</u>						
28+67	St. Clair County Hwy. 39	422.2	St. Louis	45.7 (1)	Closure Structure	1
186+52	Terminal R.R. of St. Louis	422.9	St. Louis	46.4 (1)	Closure Structure	2
196+54	G.M.&O. R.R.	425.5	St. Louis	49.0 (1)	Closure Structure	4
545+72	Ill. Hwy. No. 157	420.0	St. Louis	47.5 (2)	Closure Structure	3
761+23	Mo. Pac. R.R.	423.3	St. Louis	50.1 (1)	Sandbags	5

(1) Closure stage based on backwater. Flash flood conditions may require earlier closure.

(2) Approximate. Time of closure may be affected by swellhead on highway embankment leading to Jefferssen Barracks Bridge.

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Levee Station	Floodwall or Levee Opening	Elevation of Opening (N.G.V.D.)	Stage for Closing		Method of Closure	Order of Closure
			Gage	Gage Reading		
<u>GRAND TOWER DRAINAGE AND LEVEE DISTRICT</u>						
18+12	Illinois Central R.R.	367.5	Grand Tower	44.7 (1)	Closure Structure	2
434+33	Illinois Central R.R.	358.3	Grand Tower	38.5 (2)	Closure Structure	1
(1) Closure will not be required unless C.I.P.S. levee becomes critical.						
(2) Closure stage based on backwater. Flash flood conditions may require earlier closure.						
<u>PRESTON DRAINAGE AND LEVEE DISTRICT</u>						
143+62	Illinois Central R.R.	358.4	Grand Tower	38.6 (1)	Closure Structure	
(1) Closure stage based on backwater. Flash flood conditions may require earlier closure.						
<u>CLEAR CREEK DRAINAGE AND LEVEE DISTRICT</u>						
<u>RIVER FRONT LEVEE</u>						
NONE						
<u>BACK LEVEE</u>						
798+52	Illinois Hwy. No. 146	355.7	--	-- (1)	Closure Structure	(1)
(1) Closure stage contingent upon flash flood conditions only.						
<u>EAST CAPE GIRARDEAU AND CLEAR CREEK D&L DISTRICT</u>						
527+12	Illinois Hwy. No. 3	345.0	Cape Girardeau	45.3	Closure Structure	

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APPENDIX E

SUPPLIES AND EQUIPMENT STOCKPILED FOR IMMEDIATE USE DURING DISASTERS OWNED BY DISASTER PREPAREDNESS

<u>ITEM</u>	<u>QUANTITY</u>	<u>SIZE</u>
* Sandbags	1,077,500	(14 in x 26 in Approx)
Snow Fence	257 rolls	(50 ft x 4 ft Approx)
Plastic Sheeting 4 mil	598 rolls	(10 ft x 100 ft Approx)
Mirafi fabric (No. 140, Sub-Surface <u>use only</u>)	7 rolls	(15 ft x 360 ft Approx)

The above items are located at St. Louis Area Support Center.

ITEM ON HAND

Cameras (20 Polaroid Sun Cameras, LMSOD-E)	20 each
Generator Electric:	
2500 watt, Homelite (Gasoline)	6 each
Pumps, Crisafulli:	
8-inch (Prime Mover Gas or Diesel Tractor)	4 each
12-inch (Prime Mover Gas or Diesel Tractor)	14 each
16-inch (Prime Mover Gas or Diesel Tractor)	1 each

*

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APPENDIX E

SUPPLIES AND EQUIPMENT AVAILABLE FROM
DISTRICT STOCKS AND OPERATIONS

<u>Floating Plant</u>	<u>HP</u>	<u>Time Required for Mobilization - Days</u>
Towboats:		
* Grand Tower	400	1
Patrolboats:		
PATHFINDER	850	2**
Tenders:		
KASKASKIA	400	1
KIMMSWICK	400	1
PRAIRIE DU ROCHER	400	1
Launches:		
Pittsburgh, CINCINNATI, HARDIN and MOORE	680 Total	1 day each
Dredges:		
POTTER 1800		4**
Barges:		
	<u>TONS</u>	
10 Deck Steel	600 Tons	
3 Steel, Fuel	2000 to 9500 total capacity BBLs.	
2 Store 600 Tons		
18 Flats, Steel	50 Tons	
19 Pontoons, Steel (Pipeline)	40 Tons	
2 Buoy 200 Tons		

*

** If drained with piping disconnected.

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Derricks:	<u>Lifting Tonnage</u>	<u>Time Required For Mobilization - Days</u>
No. 5	15 Tons	1
No. 6	15 Tons	1
No. 107	50 Tons	1
Sewell	125 Tons	1

Construction Equipment

a. Listed are several types of construction equipment located within the St. Louis District. (This listing is too numerous to show each item, see Project-Owned Plant Inventory & Status Report, LMV Form 338 and the Accountable Property Master List)

<u>Category</u>	<u>Description</u>
Crane, Mobile (rubber-tired)	Lorain, Moto, Model 320, 40 Ft. boom, 20 ton capacity
Crane, Mobile (rubber-tired)	Lorain, Moto, Model 330, 50 Ft. boom, 30 ton capacity
Loader, Front End	Track-type tractor, caterpillar 922
Loader, Front End	Track-type tractor, John Deere 555
Patrol, Motor	Wabco, Model 440
Patrol, Motor	John Deere, Model 770
Tractor, Crawler	Caterpillar, Model D-6

b. The above mentioned listings are located in LMSOD-E and will be available in the EOC upon activation.

Other Equipment. This classification of equipment pertains to test equipment, tools and office related items and is listed under the Accountable Property Master List.

Communications

225+	Radio-equipped automobiles and trucks within SLD 110 watt (4 channel) FM
200+	Handie-Talkies, High Band, 5 watt avg., FM (4 channel)
10	Units of Floating Plant Maritime and High Band
4	SSB for Flood Emergency 100 watt (10 channel)

Note: Also see DR 500-1-2. Emergency Communications Plan

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APPENDIX F

FUNDING AND ACCOUNTING

F-1. GENERAL. Detailed procedures and guidance are provided in ER 500-1-1, Natural Disaster Procedure, ER 37-2-10, Financial Administration, Accounting and Reporting Civil Works Activities and ER 11-1-320, Army Programs, Civil Works Activities, Flood Control and Coastal Emergencies.

F-2. REVOLVING FUND ACCOUNTS. The listed following accounts are initiated during Emergency Operations, Code 200, for flood emergencies:

<u>Name</u>	<u>Revolving Fund Cost Code</u>
Elsberry Office	VW8110150000XXX
District Office (EOC)	VW8110200000XXX
East Side Area Office	VW8110250000XXX
Cape Girardeau Area Office	VW8110300000XXX
Illinois River Area Office	VW8110350000XXX
Kaskaskia River Area Office	VW8110400000XXX
St. Louis Area Office	VW8110450000XXX
Meramec River Area Office	VW8110650000XXX
Salt River Area Office	VW8110700000XXX

The remaining three (3) digits will be provided by LMSDC-F upon activation of the EOC. However, if more than one flood event occurs in a FY the ending digits will reflect the sequence of the flood.

F-3. OTHER ACCOUNTS. Work for FEMA during Hazard Mitigation and Damage Surveys will be funded by the revolving fund account in the same manner as above. The difference would be a complete set of new account numbers.

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APPENDIX G

SAFETY AND OCCUPATIONAL HEALTH

G-1. REFERENCES: EM 385-1-1 revised Oct. 85; DIVR 385-1-1, AR 385-10 and USACE Suppl 1, and AR 385-1-40, Suppl 1.

G-2. MISSION: To provide staff advice to the commander and manage a program to control and minimize loss during the accomplishment of the disaster operations. The program will provide work areas that are free recognized hazards that could cause serious harm to the government, contractor, or the public, and provide for increased efficiency and productivity.

G-3. EXECUTION: Accident reporting requirements will be as prescribed in Appx. J, DIVR 385-1-1, dated 5 Apr 85. Instructions for preparation of ENG Form 3394 are contained in Suppl 1 to AR 385-40. Each flood area office is responsible for making safety surveys and inspections to minimize injuries and reduce property damage during emergency operations. Advice and coordination will be available from the Safety and Occupational Health Office. Particular areas of concern are protective equipment and apparel, unsafe construction equipment, and unsafe driving practices. Lost-time accidents for Government or Contractor employees must be reported immediately by telephone or radio to the Safety and Occupational Health Office and followed by the written report. Non-lost time accidents for Government employees only will be reported by written report within 3 days. All efforts will be made by Area Offices to pay for these first aid type injuries by a small purchase method. For more information in this matter, consult the Safety and Occupational Health Office.

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APPENDIX H

TRANSPORTATION AND TRAVEL

H-1. GENERAL. Detailed procedures and guidance for Air Transportation and Travel are provided in the following:

- a. AR 55-355, Military Traffic Management Regulation
- b. AR 59-9, Military Airlift Command
- c. AR 59-22, Special Mission Aircraft
- d. AR 59-40, Single Manager Airlift Service
- e. AR 95-10, Use of Army Aviation in Disaster Operations and Search and Rescue Operation
- f. ER 55-1-1, Traffic Management
- g. ER 55-1-2, Travel Management
- h. ER 500-1-1, Natural Disaster Procedures

* H-2. AIR TRANSPORTATION. Arrangements for commercial air transportation are normally made through the Transportation Agent, Office of Logistics Management. For helicopter service, requests are made thru the EOC, Transportation Coordinator. *

H-3. MILITARY TRAFFIC MANAGEMENT AND TERMINAL SERVICE (MTMTS). Technical assistance is available from the MTMTS in furnishing information on the most effective and economic procurement and use of commercial transportation to meet the requirements of civil works activities.

H-4. SUPPLIES AND EQUIPMENT. ER 55-1-1 provides procedure and guidance for Corps of Engineers in transportation of Government-owned equipment, materials and supplies (includes commercial air transportation and charter service) required for civil works activities. (For military air transportation see AR 59-9 and AR 59-40).

H-5. LMVD AIRCRAFT. Movement of LMVD personnel, material and supplies by aircraft during emergency operations will be in accordance with the following supplemented paragraphs:

- a. The LMVD aircraft will be made available to districts during emergencies when not required by the Division Commander or his staff. Request for use of the aircraft will be through normal channels. Commercial or privately owned aircraft may be contracted for during emergency. Use of Government-owned or chartered aircraft will be approved by the Division Commander except for intermittent one-trip use which may be approved by the District Commander (APP. III, DIVR 1-1-3).

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b. Normal priority in use of aircraft will be the LMVD aircraft, commercial or privately owned, National Guard, Air National Guard, Regular Army and Air Force. All requests for Army or Air Force aircraft will be to the Division Commander, ATTN: LMVDD/LMVCO-E.

c. Requests for aircraft should state the intended use including such items as the number of people to be transported, equipment or supplies to be moved (weight and cubage), area to be photographed, pick-up point, destination, and such other pertinent information as may be required for a full understanding of the need.

d. The District Commander will advise the Division Commander as far in advance as possible when need for Service Aircraft is anticipated.

H-6. GROUND TRANSPORTATION. Provisions for use of Government-owned vehicles during a flood emergency will be made through the EOC, District Dispatcher. These vehicles will be loaned from the district pool and from field offices. Rental of additional vehicles will be made through the EOC, if required.

H-7. RIVER TRANSPORTATION. Provisions for use of floating plant during a flood emergency will be made through the EOC and Operations Divisions, Channel Maintenance Branch.

H-8. TRAVEL. Each individual involved in Flood Emergency Operations or other Natural Disaster Activities must have their own travel orders prepared through their respective Division office. Cost accounts will be available by notifying the EOC.

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1 Apr 86

APPENDIX I

PART I

NATURAL DISASTER ORGANIZATION
UNDER PL 84-99

DR 500-1-1
CHANGE 1
15 Jun 87

**St. Louis District
Natural Disaster Procedures
Under PL 84-99**

**EMERGENCY OPERATIONS
CENTER**

L. J. Chiodini, Jr.
B. F. Venturella, Jr.

ADMINISTRATION

Hydrologic and Hydraulic

H. T. Martin
C. N. Strauser
R. D. Mills

Situation Reports

* R. V. Lindsay

Cost Accounting

Coordinator

Ms. G. E. Hurley
C. E. Sherrill

**Safety and Occupational
Health**

* G. L. Groenemann

Public Affairs

* C. A. Wilkes

**Geotechnical Safety
and Evaluation**

B. H. Moore
G. J. Postol

Engineering Coordinator

G. L. Davis *
M. E. Dace

Damage Estimates

E. D. Rahubka

Transportation

B. J. Jones *

Operations Division

J. A. Petersen *
M. J. Cullen

Real Estate Division

T. R. Hewlett

DR 500-1-1
CHANGE 1
15 Jun 87

SERVICES

Pumping Station

J. W. Luther

Floating Plant

* D. D. Huston

Procurement

* Ms. J. Bode

Dispatcher

Ms. S. Freesmeier

Plant-Service Base

P. A. Nottmeier

Communications

Ms. H. Tillerson *

Contracts

Ms. J. F. Schick *

Media and Publication

(To be designated) *

FLOOD EMERGENCY AREAS

Elsberry Area Elsberry, Missouri

C. K. Grojean, Flood Area Engr
R. R. Sovar, Asst Flood Area Engr

East Side Area Lock-27, Granite City, Illinois

* D. L. Chrismore, Flood Area Engr
* (To be designated), Asst Flood Area Engr

Cape Girardeau Area Cape Girardeau, Missouri

W. E. Busch, Flood Area Engr
C. W. Dees, Asst Flood Area Engr

Meramec River Area Ste. Genevieve, Missouri

* K. D. Corbin, Flood Area Engr
* P. S. Eydmann, Asst Flood Area Engr

Illinois River Area Jacksonville, Illinois

E. W. Hahn, Flood Area Engr
S. F. Ebersohl, Asst Flood Area Engr

St. Louis Area Illinois Resident Office

L. Ross, Flood Area Engr *
D. F. Beard, Asst Flood Area Engr *

Kaskaskia River Area Lake Carlyle, Illinois

M. D. Skinner, Flood Area Engr
A. P. Lookofsky, Asst Flood Area

Salt River Area Monroe City, Missouri

C. K. Grojean, Flood Area Engr *
D. D. Foss, Asst Flood Area Engr *
D. N. Ward, Asst Flood Area Engr *

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CHANGE 1
15 Jun 87

APPENDIX I

Personnel Assigned to Various Flood Fight Areas

SALT RIVER AREA

FLOOD AREA ENGINEER

* C. Grojean # (LMSPO-U) *

* D. Foss (LMSOD-RJ) *

* D. Ward (LMSOD-RJ) *

ADMINISTRATIVE OFFICER

* (To be designated)

OFFICE ENGINEER

Ms. P. Mudd (LMSRO-C) *

NEW LONDON SECTOR

* D. Ward # (LMSOD-RJ)

* T. Wayne Williams (LMSOD-RJ) *

- In Charge.

Chart shown is a minimum organization. Flood Area Engineers will expand their organization as necessitated by field conditions and anticipated flood crests. Requests for additional personnel will be submitted through the EOC.

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CHANGE 1
15 Jun 87

APPENDIX I

ELSBERRY AREA

FLOOD AREA ENGINEER

C. Grojean # (LMSP0-U)
R. Sovar (LMSED-DA)

ADMINISTRATIVE OFFICER

(To be designated)

ELSBERRY SECTOR

M. Rector # (LMSED-DG)
P. Roberts (LMSED-DM)

OFFICE ENGINEER

Ms. C. Leffeler (LMSP0-U)

WINFIELD SECTOR

P. Olson # (LMSED-HS)
V. Behrmann (LMSED-DG)

RIVER AND LOUISIANA SECTOR (MOBIL) LOCK AND DAM 24 - HEADQUARTERS

J. Buckley # (L&D 24)
(To be designated)

- In Charge.

Chart shown is a minimum organization. Flood Area Engineers will expand their organization as necessitated by field conditions and anticipated flood crests. Requests for additional personnel will be submitted through the EOC.

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APPENDIX I

ILLINOIS RIVER AREA

FLOOD
AREA ENGINEERE. Hahn # (LMSPD-F)
S. Ebersohl (LMSOD-R)ADMINISTRATIVE OFFICER

(To be designated)

MEREDOSIA SECTORJ. Helfrich # (LMSED-DA)
S. Miller (Dre. POTTER)GRIGGSVILLE SECTORM. Kruckeberg # (LMSED-DG)
B. FehI (LMSED-DA)OFFICE ENGINEER

D. Klosterman (LMSPD-E)

HILLVIEW SECTORC. Talbot # (LMSOD-RJ)
A. Bienkowski (LMSED-DA)ELDRED SECTORW. Gidcomb (LMSOD-RS)
E. Riiff (LMSED-DA)WINCHESTER SECTORJ. Scanlon # (LMSED-DG)
T. Leicht (LMSED-DA)

- In Charge.

Chart shown is a minimum organization. Flood Area Engineers will expand their organization as necessitated by field conditions and anticipated flood crests. Requests for additional personnel will be submitted through the EOC.

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CHANGE 1
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APPENDIX I

EAST SIDE AREA

FLOOD AREA ENGINEER

D. Chrismore # (LMSCD-C)
(Asst. - To be designated)

ADMINISTRATIVE OFFICER

(To be designated)

WOOD RIVER SECTOR

J. MacMorran # (LMSCD-CC)
Ms. I. Smugala (LMSCD-CP)

CHOUTEAU ISLAND SECTOR

D. Fendler # (LMSED-D)
Ms. B. Pitrolo (LMSRE-M)
T. Niedernhofer (LMSED-DA)

OFFICE ENGINEER

Ms. L. Puetz (LMSCD-CP)

EAST ST. LOUIS SECTOR

G. Bertoglio # (LMSED-DG)
R. Reiter (LMSRO-L)

DUPO SECTOR

K. Tilkens # (LMSOD-RC)
R. Hansen (LMSOD-F)

PRAIRIE DU ROCHER SECTOR

V. Polizzi # (LMSCD-Q)
S. Dierker (LMSOD-R)

PUMPING STATION COORDINATOR

D. Fogel (LMSOD-PI)

- In Charge: as this organization field of designated as follows: as field
Chart shown is a minimum organization. Flood Area Engineers will expand
their organization as necessitated by field conditions and anticipated
flood crests. Requests for additional personnel will be submitted through
the EOC.

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CHANGE 1
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APPENDIX I

ST. LOUIS AREA

FLOOD AREA ENGINEER

L. Ross (LMSCD-C)
D. Beard (LMSRO-F)

ADMINISTRATIVE OFFICER

P. Reed (LMSRO-F)

ST. PETERS SECTOR

S. Zurweller # (LMSCD-CP)
G. Allen (LMSCD-C)
B. Finley (LMSRO-F)

ST. LOUIS FLOOD PROTECTION SECTOR

G. Miano # (LMSCD-Q)
R. Ubben (LMSRO-F)

OFFICE ENGINEER

K. Christmas (LMSRO-F)

NORTH ST. LOUIS SECTOR

D. Taylor # (LMSED-SS)
Ms. G. Davis (LMSRO-F)

SOUTH ST. LOUIS SECTOR

T. Johnson # (LMSOD-PI)
R. Rauh (LMSCD-Q)

- In Charge.

Chart shown is a minimum organization. Flood Area Engineers will expand their organization as necessitated by field conditions and anticipated flood crests. Requests for additional personnel will be submitted through the EOC.

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CHANGE 1
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APPENDIX I

MERAMEC RIVER AREA

FLOOD AREA ENGINEER

K. Corbin # (LMSPD-M)
P. Eydmann (LMSED-HE)

ADMINISTRATIVE OFFICER

(To be designated)

VALLEY PARK SECTOR

G. Camp # (LMSRE-M)
R. Pope (LMSPD-F)

FESTUS-CRYSTAL CITY SECTOR

D. Leake # (LMSPF-F)
D. Stevens (LMSED-H)

OFFICE ENGINEER

(To be designated)

ARNOLD SECTOR

P. Eydmann # (LMSED-HE)
S. Trebs (LMSOD-RC)

STE. GENEVIEVE SECTOR

K. Corbin # (LMSPD-M)
J. Naeger (LMSED-D)
M. Stohl (LMSED-DA)

- In Charge.

Chart shown is a minimum organization. Flood Area Engineers will expand their organization as necessitated by field conditions and anticipated flood crests. Requests for additional personnel will be submitted through the EOC.

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CHANGE 1
15 Jun 87

APPENDIX I

KASKASKIA RIVER AREA

FLOOD AREA ENGINEER

M. Skinner # (LMSOD-RS)
A. Lookofsky (LMSOD-RS)

ADMINISTRATIVE OFFICER

(To be designated)

VANDALIA SECTOR

A. Lookofsky # (LMSOD-RS)
S. Summers (LMSOD-RS)

OFFICE ENGINEER

T. Bloor (LMSOD-RS)

BARTELSO SECTOR

J. Lueke # (LMSOD-RC)
R. Harlan (LMSOD-RC)

- In Charge.

Chart shown is a minimum organization. Flood Area Engineers will expand their organization as necessitated by field conditions and anticipated flood crests. Requests for additional personnel will be submitted through the EOC.

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CHANGE 1
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APPENDIX I

CAPE GIRARDEAU AREA

FLOOD AREA ENGINEER

W. Busch # (LMSP0-L)
C. Dees (LMSOD-RR)

ADMINISTRATIVE OFFICER

Ms. D. Kutz (LMSP0-L)

OFFICE ENGINEER

J. Beyatte (Dre. POTTER)

DEGOGNIA SECTOR

T. Gardner # (LMSCD-CP)
F. Niermann (LMSOD-F)

PERRY COUNTY SECTOR

C. Turlin # (LMSED-HS)
D. Surface (LMSP0-L)

WARE SECTOR

S. Jones # (Dre. POTTER)
J. Zimmerman (LMSP0-L)

KASKASKIA ISLAND SECTOR

J. Hill # (LMSPD-R)
D. Berti (LMSOD-RJ)

CAPE GIRARDEAU SECTOR

D. Woodruff # (LMSCD-Q)
B. Douglas (LMSCD-CC)

OLIVE BRANCH SECTOR

C. Caldwell # (LMSP0-L)
P. McGinnis (LMSOD-R)

* # - In Charge.

Chart shown is a minimum organization. Flood Area Engineers will expand their organization as necessitated by field conditions and anticipated flood crests. Requests for additional personnel will be submitted through the EOC.

DR 500-1-1
1 Apr 86

APPENDIX I

PART II

NATURAL DISASTER ORGANIZATION
UNDER PL 93-288

DR 500-1-1
CHANGE 1
15 Jun 87

Personnel Trained for FEMA Response

District Field Coordinator

B. F. Venturella, Jr.

* R. Sovar, LMSED-DA
J. Naeger, LMSED-DA
R. Davinroy, LMSED-HE
R. Hanson, LMSOD-F
D. Berti, LMSOD-RR
D. Ward, LMSOD-RJ
P. Olson, LMSED-HS
R. Harlan, LMSOD-RC
W. Gidcomb, LMSOD-RS
P. McGinnis, LMSOD-R

C. Grojean, LMSPO-U
J. Helfrich, LMSED-DA
P. Eydmann, LMSED-HE
R. Pope, LMSPD-F
C. Talbott, LMSOD-RJ
C. Dees, LMSOD-RR
C. Placher, LMSOD-RW
A. Basuel, LMSOD-PI
S. Trebs, LMSOD-RC
M. Skinner, LMSOD-RS
S. Miller, Dre POTTER

*

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1 Apr 86

SAMPLE ORGANIZATION DISASTER AREA OFFICE

AREA OFFICE

SubArea Office

Area Engineer
1 Office Engineer
1 Clerk-Typist
3 Contract Negotiators
6 Construction Engineers

Disaster Survey Teams

1 Team Leader
1 Civil Engineer
1 Mechanical Engineer
1 Electrical Engineer

Audit &
Accounting

Assistant

Supply

Assistant

Engineering

Chief
1 Civil Engineer
1 Structural Engineer
1 Soils Engineer
1 Sanitary Engineer
1 Mechanical Engineer
1 Electrical Engineer
1 General Engineer

Real Estate

Chief

Public
Affairs

Chief

Administrative

Chief
1 Personnel
1 Clerk-Typist

Safety

Chief

Legal

Chief

Construction

Chief
3 Construction Engineers
2 Contract Negotiators

NOTE: Size and composition to be varied to suit nature of natural disaster or recovery operations.

DR 500-1-1
1 Apr 86

APPENDIX J

PRINCIPAL GAGES, RECORD FLOOD STAGES
AND GENERAL LEVEE DATA

DR 500-1-1
1 Apr 86

PRINCIPAL GAGES ALONG MISSISSIPPI RIVER
AND FLOOD STAGES (cont'd)

Miles above mouth of Ohio River	Gage zero NGVD	Gage	Approximate flood stage
145.8	0.00	Selma, MO	390
136.0	357.78	Brickeys, MO	26
125.5	213.79	Little Rock Landing, MO	163
109.9	341.05	Chester, IL	27
100.8	334.11	Bishop Landing, MO	29
94.1	328.92	Red Rock Landing, MO	31
81.9	321.93	Grand Tower, IL	28
66.3	313.89	Moccasin Springs, MO	28
52.0	304.65	Cape Girardeau, MO	32
46.3	301.18	Grays Point, MO	25
43.7	300.00	Thebes, IL	33
42.3	304.35	Counterfeit Rock, MO	24
39.5	301.83	Commerce, MO	24
28.2	299.75	Price Landing, MO	24
20.2	0.00	Thompson Landing, MO	319
2.0	274.53	Birds Point, MO	38
2.0	270.47	Cairo, IL (Ohio River) ++	40

++ Memphis District

DR 500-1-1

1 Apr 86

APPENDIX JPRINCIPAL GAGES ALONG MISSISSIPPI RIVER
AND FLOOD STAGES

Miles above mouth of Ohio River	Gage Zero N.G.V.D. 1929	Gage	Approximate flood stage
301.2	446.10	L&D No. 22 - Lower *	12
293.0	441.85	Mundys Landing, Mo.	14
282.9	437.33	Louisiana, Mo.	15
273.2	421.81	L&D No. 24 - Lower	25
265.0	426.03	Rip Rap Landing, IL	17
260.3	0.0	Mosier Landing, IL	441
250.8	420.48	Sterling Landing, MO	16
241.2	407.09	L&D No. 25 - Lower	26
228.3	410.62	Dixon Landing, IL	16
218.0	403.79	Grafton, IL	18
202.7	395.48	L&D No. 26 - Lower	21
196.8	0.0	Hartford, IL	417
190.4	313.91	Chain of Rocks, MO	101
179.6	379.94	St. Louis, MO (Market St.)	30
176.8	379.58	Engineer Depot, MO	29
168.7	377.69	Jefferson Barracks, MO	26
158.5	370.39	Waters Point, MO	27

+ Rock Island District

DR 500-1-1
CHANGE 1
15 Jun 87

PRINCIPAL GAGES ALONG LOWER ILLINOIS RIVER
AND FLOOD STAGES
(MOUTH TO MILE 80.0)

Miles above mouth of river	Gage zero NGVD	Gage	Approximate flood stage
* 21.6	0.00	Hardin, IL	425
43.2	0.00	Pearl, IL	424
56.0	0.00	Florence, IL	425
61.3	0.00	Valley City, IL	426
70.8	0.00	Meredosia, IL	432
80.1	406.00	LaGrange L&D - Lower +	23
88.8	419.90	Beardstown, IL ++	14

+ Chicago District

++ Railroad Bridge Gage near but not in St. Louis District; cooperative station owned by National Weather Service or U.S. Geological Survey in Chicago District.

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1 Apr 86

PRINCIPAL GAGES ALONG THE MERAMEC RIVER
AND FLOOD STAGES

Miles above mouth of river	Gage zero NGVD	Approximate flood Gage	stage
6.0	373.21	Arnold, MO +	24
22.1	392.92	Valley Park, MO +	16
34.1	404.18	Eureka, MO +	18
50.5	432.53 ++	Pacific, MO +	15
117.0	581.82	Sullivan, MO +	15

+ Cooperative station owned by National Weather Service or U.S.
Geological Survey

++ Gage installed in 1983

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1 Apr 86

PRINCIPAL GAGES ALONG BIG MUDDY RIVER
AND FLOOD STAGES

Miles above mouth of river	Gage zero NGVD	Gage	Approximate flood stage
37.0	335.50	Murphysboro, IL +	16
85.1	358.24	Plumfield, IL +	10

+ Cooperative station owned by National Weather Service or U.S.
Geological Survey

PRINCIPAL GAGES ALONG SALT RIVER
AND FLOOD STAGES

Miles above mouth of river	Gage zero NGVD 1943	Gage	Approximate flood stage
35.5	477.03	New London, MO	19

DR 500-1-1
CHANGE 1
15 Jun 87

RECORD FLOOD STAGES AND
PRINCIPAL GAGES
ST. LOUIS DISTRICT

Mississippi River									
Louisiana, MO *		Alton, IL		St. Louis, MO **		Chester, IL ***		Cape Girardeau MO ****	
mi. 282.9		mi. 202.7		mi. 179.6		mi. 109.9		mi. 51.9	
0=437.33 NGVD		0=395.48 NGVD		0=379.94 NGVD		0=341.05 NGVD		0=304.65 NGVD	
FS=15 ft.		FS=21.0 ft.		FS=30 ft.		FS=27 ft.		FS=32 ft.	
Stage feet	Year	Stage feet	Year	Stage feet	Year	Stage feet	Year	Stage feet	Year
27.05	1973	36.63	1973	43.3	1973	43.32	1973	45.6	1973
+22.7	1983 Apr	36.63	1844	41.32	1844	+40.99	1983 May	+45.05	1983 May
22.25	1947	34.43	1943	40.2	1947	39.83	1844	44.4	1979
* 22.2	1969	+34.3	1986 Oct	40.16	1951	+39.8	1982	+43.5	1982 Dec *
22.05	1965	33.99	1951	+39.28	1983 May	39.79	1979	42.53	1844
22.0	1979	33.92	1947	39.05	1944	+39.4	1982 Dec	42.37	1943
* 21.9	1851	33.84	1944	+38.9	1986 Oct	+39.2	1986 Oct	+42.2	1983 Apr
* 21.1	1929	33.82	1903	38.88	1943	38.3	1951	+42.1	1986 Oct *
20.9	1960	+33.2	1983 May	+38.6	1982	38.17	1947	41.88	1947
20.5	1951	32.72	1858	38.0	1903	+38.1	1983 Apr	41.8	1951
20.1	1903	32.52	1979	+37.91	1982 Dec	38.08	1943	40.76	1944
19.9	1948	+32.45	1982 Dec	37.66	1979	37.55	1944	40.04	1927
19.9	1952	32.42	1851	37.2	1858	35.7	1858	39.2	1969
19.8	1944	+32.4	1983 Apr	37.1	1855	35.73	1969	+38.93	1984
		31.6	1922	36.6	1851	+34.85	1984		
				+36.5	1983 Apr	34.41	1927		

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1 Apr 86

(Continued)
RECORD FLOOD STAGES AND
PRINCIPAL GAGES
ST. LOUIS DISTRICT

Mississippi River									
Louisiana, MO *		Alton, IL		St. Louis, MO **		Chester, IL ***		Cape Girardeau MO ****	
mi. 282.9		mi. 202.7		mi. 179.6		mi. 109.9		mi. 51.9	
0=437.33 NGVD		0=395.48 NGVD		0=379.94 NGVD		0=341.05 NGVD		0=304.65 NGVD	
FS=15 ft.		FS=21.0 ft.		FS=30 ft.		FS=27 ft.		FS=32 ft.	
Stage		Stage		Stage		Stage		Stage	
feet	Year	feet	Year	feet	Year	feet	Year	feet	Year
+19.7	1982 Dec	31.2	1927	36.4	1828	34.4	1945	38.7	1945
19.44	1962	31.1	1892	36.1	1927	34.4	1952	38.4	1960
19.4	1970	30.16	1969	36.0	1892	34.3	1961	38.3	1952
18.8	1892	30.1	1929	35.9	1969	34.0	1922	38.0	1922
18.7	1945	29.36	1960	35.25	1909	34.0	1942	37.8	1948
18.6	1897	28.99	1952	35.2	1945	33.7	1960	37.7	1858
18.5	1881	28.93	1948	34.95	1908	33.4	1903	37.4	1929
+18.4	1983 May	28.66	1945	+33.70	1984	33.4	1935	36.8	1942
18.4	1967	+28.09	1984			33.1	1929		
+17.9	1984								
17.8	1919								

- + Preliminary readings subject to publication and gage inspection by USGS.
 * Information obtained from National Weather Service Records.
 ** US Geological Survey gage equipment with N.W.S. telemark and USCE satellite transmitter. USCE Auxiliary staff gage located at mile 179.6 NGVD.
 *** US Geological Survey gage equipment with N.W.S. telemark and USCE satellite transmitter. USCE auxiliary staff gage located at mile 109.5 at same datum.
 **** US Geological Survey gage equipment with N.W.S. telemark and USCE satellite transmitter. USCE auxiliary staff gage located at mile 52.1, zero = 304.65 NGVD

Note: MSL (Mean Sea Level) classification has now been changed to "National Geodetic Vertical Datum" (NGVD).

DR 500-1-1
CHANGE 1
15 Jun 87

RECORD FLOOD STAGES AND
PRINCIPAL GAGES
ST. LOUIS DISTRICT
(Mouth to Mile 80.0)

Illinois River			
Beardstown, IL mile 88.8 0 = 419.90 NGVD Rock Island District FS 14 ft.		* Meredosia, IL mile 70.8 0 = 0.0 NGVD St. Louis District FS 432 ft.	
Stage feet	Year	Stage feet	Year
29.7	1943	446.7	1943
28.5	1985 Mar	+445.6	1985 Mar
28.1	1979	445.10	1979
+27.3	1982 Dec	444.7	1973
27.1	1973	+444.4	1982 Dec
+26.6	1982 Mar	+443.5	1982 Mar
26.2	1974	443.29	1944
26.2	1926	+443.1	1983 Apr
26.2	1944	442.0	1926
+25.5	1983 Apr	441.53	1933
25.5	1933	441.5	1927
25.15	1927	441.21	1922
25.1	1922	440.2	1962
23.2	1962	439.8	1913
+22.6	1984	+439.7	1984
		+439.5	1986 Oct

*

*

DR 500-1-1
1 Apr 86

(Continued)
RECORD FLOOD STAGES AND
PRINCIPAL GAGES
ST. LOUIS DISTRICT

Mississippi River									
Louisiana, MO *		Alton, IL		St. Louis, MO **		Chester, IL ***		Cape Girardeau MO ****	
mi. 282.9		mi. 202.7		mi. 179.6		mi. 109.9		mi. 51.9	
O=437.33 NGVD		O=395.48 NGVD		O=379.94 NGVD		O=341.05 NGVD		O=304.65 NGVD	
FS=15 ft.		FS=21.0 ft.		FS=30 ft.		FS=27 ft.		FS=32 ft.	
Stage		Stage		Stage		Stage		Stage	
feet	Year	feet	Year	feet	Year	feet	Year	feet	Year
+19.7	1982 Dec	31.2	1927	36.4	1828	34.4	1945	38.7	1945
19.44	1962	31.1	1892	36.1	1927	34.4	1952	38.4	1960
19.4	1970	30.16	1969	36.0	1892	34.3	1961	38.3	1952
18.8	1892	30.1	1929	35.9	1969	34.0	1922	38.0	1922
18.7	1945	29.36	1960	35.25	1909	34.0	1942	37.8	1948
18.6	1897	28.99	1952	35.2	1945	33.7	1960	37.7	1858
18.5	1881	28.93	1948	34.95	1908	33.4	1903	37.4	1929
+18.4	1983 May	28.66	1945	+33.70	1984	33.4	1935	36.8	1942
18.4	1967	+28.09	1984			33.1	1929		
+17.9	1984								
17.8	1919								

- + Preliminary readings subject to publication and gage inspection by USGS.
 * Information obtained from National Weather Service Records.
 ** US Geological Survey gage equipment with N.W.S. telemark and USCE satellite transmitter. USCE Auxiliary staff gage located at mile 179.6 NGVD.
 *** US Geological Survey gage equipment with N.W.S. telemark and USCE satellite transmitter. USCE auxiliary staff gage located at mile 109.5 at same datum.
 **** US Geological Survey gage equipment with N.W.S. telemark and USCE satellite transmitter. USCE auxiliary staff gage located at mile 52.1, zero = 304.65 NGVD

Note: MSL (Mean Sea Level) classification has now been changed to "National Geodetic Vertical Datum" (NGVD).

DR 500-1-1
1 Apr 86

RECORD FLOOD STAGES AND
PRINCIPAL GAGES
ST. LOUIS DISTRICT
(Mouth to Mile 80.0)

Illinois River			
Beardstown, IL mile 88.8 0 = 419.90 NGVD Rock Island District FS 14 ft.		* Meredosia, IL mile 70.8 0 = 0.0 NGVD St. Louis District FS 432 ft.	
Stage feet	Year	Stage feet	Year
29.7	1943	446.7	1943
28.5	1985 Mar	+445.6	1985 Mar
28.1	1979	445.10	1979
+27.3	1982 Dec	444.7	1973
27.1	1973	+444.4	1982 Dec
+26.6	1982 Mar	+443.5	1982 Mar
26.2	1974	443.29	1944
26.2	1926	+443.1	1983 Apr
26.2	1944	442.0	1926
+25.5	1983 Apr	441.53	1933
25.5	1933	441.5	1927
25.15	1927	441.21	1922
25.1	1922	440.2	1962
23.2	1962	439.8	1913
+22.6	1984	+439.7	1984

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RECORD FLOOD STAGES AND
PRINCIPAL GAGES
ST. LOUIS DISTRICT
(Mouth to Mile 80.0)

Illinois River			
Beardstown, IL mile 88.8 0 = 419.90 NGVD Rock Island District FS 14 ft.		* Meredosia, IL mile 70.8 0 = 0.0 NGVD St. Louis District FS 432 ft.	
Stage feet	Year	Stage feet	Year
22.5	1844	438.9	1960 & 1981
22.4	1935	438.8	1947 & 1948
22.2	1858	438.73	1916
21.9	1950	438.7	1935
		438.5	1950
		438.3	1929
		438.1	1951

* Prior to October 1959, Meredosia Gage was at mile 71.1

+ Preliminary readings subject to publication and gage inspection by USGS.

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1 Apr 86

RECORD FLOOD STAGES AND
PRINCIPAL GAGES
ST. LOUIS DISTRICT

Meramec River			
* Valley Park, MO mile 22.1 0 = 392.92 NGVD FS 16 ft.		* Eureka, MO mile 34.1 0 = 404.18 NGVD FS 18 ft.	
Stage feet	Year	Stage feet	Year
+41.0	1982 Dec	+42.89	1982 Dec
37.8	1915	39.20	1915
34.4	1916	38.90	1945 (old site)
+33.0	1983 May	+37.5	1983 May
33.0	1945	36.20	1904
32.0	1957	36.0	1916
31.1	1904	35.77	1957
30.8	1913	33.43	1979
30.7	1919	33.01	1950
30.0	1950	31.78	1943
30.4	1979	31.58	1961
		31.15	1947
		30.72	1933

- * Prior to October 1971, gage 0 = 406.18 NGVD
- + Preliminary readings subject to publication and gage inspection by USGS.

NOTE: + Record stages for Sullivan, Missouri, gage was 32.3 in 1982.
+ Record stage for Pacific, Missouri, gage was 30.8 in 1982.

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1 Apr 86

RECORD FLOOD STAGES AND
PRINCIPAL GAGES
ST. LOUIS DISTRICT

Kaskaskia River

Vandalia, IL

mile 146.1

0=453.30

FS 18.0

<u>Stage (feet)</u>	<u>Year</u>
+41.5	1983 May
27.39	1951
27.17	1961
27.1	1950
+26.66	1985 Dec
26.39	1979
26.3	1949
26.05	1944
25.97	1967
+25.9	1984
25.72	1957
25.66	1945
+25.52	1982
25.3	1943
24.70	1945

Information prior to 1967 obtained from National Weather Service records.

+ Preliminary readings subject to publication and gage inspection by USGS.

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CHANGE 1
15 Jun 87

RECORD FLOOD STAGES AND
PRINCIPAL GAGES
KANSAS CITY DISTRICT

Missouri River

#St. Charles, MO

mile 29.6

0 = 413.60 NGVD

FS 25 ft.

Stage (feet)	Year
40.1	1844
+37.5	1986 Oct
37.3	1951
36.8	1903
36.6	1943
36.5	1944
36.4	1973
35.3	1947
35.2	1935
34.8	1942
+34.05	1983 May
+33.9	1982 Dec
+33.7	1983 Apr
33.7	1967
33.3	1961
33.1	1945
33.0	1927
32.1	1979
+31.8	1984

*

*

Kansas City District

+ Preliminary readings subject to publication and gage inspection by USGS.

DR 500-1-1
1 Apr 86

RECORD FLOOD STAGES AND
PRINCIPAL GAGES
ST. LOUIS DISTRICT

Big Muddy River
Murphysboro, IL
mile 37.0
0 = 335.50 NGVD
FS 16 ft.

<u>Stage (feet)</u>	<u>Year</u>
+43.60	1982 Dec
39.03	1961
36.01	1949
35.45	1950
33.17	1946
32.65	1943
32.12	1973
+28.5	1984
29.27	1944
+26.90	1983 Apr

Information obtained from National Weather Service records.

+ Preliminary readings subject to publication and gage inspection by USGS.

DR 500-1-1
1 Apr 86

RECORD FLOOD STAGES AND
PRINCIPAL GAGES
ST. LOUIS DISTRICT

SALT RIVER

New London, MO
mile 35.5
O=477.03 NGVD
FS 19 Ft

<u>Stage (Feet)</u>	<u>Year</u>
31.80	1973
31.02	1981
30.62	1969
29.92	1958
27.64	1970
27.18	1943
26.53	1944
+21.47	1982 Dec
+21.22	1983 Apr

+ Preliminary readings subject to publication and gage inspection by USGS.

DR 500-1-1
1 Apr 86

GENERAL LEVEE DATA

Salt River Area

<u>Levee District</u>	<u>Length of Protection</u>	<u>Acres Protected</u>	<u>Principal Gage</u>	<u>Over- Topping Stage</u>
Pike Grain Co. PL #1	1.2	240	(1)	-
Pike Grain Co. PL #2	2.7	600	(1)	-
Pike Grain Co. PL #3	4.1	500	(1)	-
Valley Drainage District	5.0	1,400	(2)	-

NOTES:

- (1) New London, MO Gage, mi. 35.5, 0 = 477.03 NGVD, FS = 19.0
(2) No existing gages.

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CHANGE 1
15 Jun 87

GENERAL LEVEE DATA

Elsberry Area

<u>Levee District</u>	<u>Length of Protection</u>	<u>Acres Protected</u>	<u>Principal Gage</u>	<u>Over- Topping Stage</u>	
Annada PL	9.0	3,320(5)	(2)	33.5	
Brevator	5.7	1,841	(4)	33.5	
Cap Au Gris	7.0	3,491	(4)	34.0	
Clarksville Levee					
* Assn PL	4.8	2,340(6)	(2)	34.5	*
Elsberry	23.8	23,481	(2)	35.0	
Foley	3.8	1,214	(4)	34.5	
* Goose Pastures Farm PL	2.3	300	(2)	33.0	*
Heitman PL	2.6	300	(4)(3)	34.0	
King's Lake D&L (RF)	7.8	3,300	(2)	35.0	
King's Lake D&L (BL)			(4)	34.0	
Kissinger D&L	6.8	2,290	(2)	35.5	
* Marstan-Portuheck PL	5.5	755	(4)	34.0	*
Old Monroe PL	3.7	900	(4)(3)	33.0	
Pettus-Burns-					
Prewitt-Jaeger PL	3.2	400	(2)	30.5	
Sandy Creek	2.5	944	(4)	34.0	
* Schramm PL	1.0	280	(4)	33.5	*
Stone-Murdock PL	1.8	360	(2)	(3)	
Winfield	9.4	2,826	(4)	34.0(RF)	
* Busch	1.3	110	(2)	31.5	*

NOTES:

- (1) Louisiana, MO Gage, mi. 282.9, 0 = 437.33 NGVD, FS = 15.0
- (2) Lock & Dam No. 24 - Lower Gage, mi. 273.2, 0 = 421.81 NGVD, FS = 25.0
- (3) Subject to flash floods.
- (4) Lock & Dam No. 25 - Tailwater Gage mi. 241.2, 0 = 407.09 NGVD, FS = 26.0
- (5) Consists of Omohundro, H.A. Wells, W.L. Wells, and Guinns Creek Private Levees.
- (6) Consists of Guber Bryant PL, Schaeffer Bros. PL and Mackey PL.
- (RF) Riverfront Levee.
- (BL) Back Levee.

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CHANGE 1
15 Jun 87

GENERAL LEVEE DATA

Illinois River Area

<u>Levee District</u>	<u>Length of Protection</u>	<u>Acres Protected</u>	<u>Over- Topping Elevation NGVD</u>
Big Swan	11.3	12,300	442.0
* Coon Run	9.4	4,600	(1)
Eldred	11.8	10,500	443.0
Farrow PL	0.7	700	(1)
Hartwell	12.2	8,900	441.0
Hillview	12.8	12,900	441.0
Indian Creek	1.7	500	(1)
Keach	12.4	8,400	442.5
Levis-Robley PL	4.0	1,000	(1)
Little Creek	5.8	1,800	445.3
Mauvais Terre	6.4	4,000	442.3
McGee Creek	14.6	12,235	454.0
Meredosia Lake	10.8	8,100	447.5
Mud Creek	2.5	3,175	(1)
New Pankey's Pond	2.3	1,500	(1)
Nutwood	12.3	11,300	438.5
Oakes PL	1.9	400	(1)
Robertson PL	1.9	1,000	443.5
Schaefer PL	1.6	100	(1)
Scott County	17.0	10,500	443.0
Smith Lake PL	0.4	1,500	443.5
Spankey	1.7	800	(1)
Valley City	8.2	4,500	444.5
Village of Pearl PL	0.7	1,000	(1)
Walnut Creek PL	2.0	500	(1)
Willow Creek	7.0	4,000	(1)

NOTES:

(1) Affected by flash floods.

(2) The above elevations are based on the following gaging stations on the Illinois River System from River Mile 0.0 to 88.8.

DR 500-1-1
1 Apr 86

GENERAL LEVEE DATA

Illinois River Area

<u>RM</u>	<u>Gaging Station</u>	<u>Zero Elevation</u>	<u>+</u>	<u>Flood Stage</u>	<u>=</u>	<u>Water Elevation</u>
88.8	Beardstown, IL	419.90	+	14.0	=	433.90
70.8	Meredosia, IL	0.00	+	432.00	=	432.00
21.6	Hardin, IL	0.00	+	425.00	=	425.00
0.5	Grafton, IL	403.79	+	18.0	=	421.79

Overtopping Elevation - Water Elevation = Free board. However, to obtain Free board a profile map of the above gages must be plotted to arrive at Free board.

DR 500-1-1
CHANGE 1
15 Jun 87

GENERAL LEVEE DATA

East Side Area

<u>Levee District</u>	<u>Length of Protection</u>	<u>Acres Protected</u>	<u>Principal Gage</u>	<u>Over- Topping Stage</u>	
* Boesel PL	2.4	800	(2)	37.5	*
CN&V	0	4,800	-	-	
Chouteau Island	11.3	2,400	(2)	39.0	
Columbia	20.1	14,000	(2)	48.0	
Metro East Sanitary District	19.8 (5)	61,645	(2)	54.0	
Edgar Lakes	0.5	3,000	(2)	48.0	
Fish Lake	4.9	2,440	(2)	54.0	
Ft. Chartres & Ivy Ldng	9.3	15,900	(2)	48.0	
Harrisonville	21.4	27,800	(2)	48.0	
Prairie du Pont	10.3	9,560	(2)	54.0	
Prairie du Rocher	16.5	13,000	(4)	48.0	
Stringtown	3.7	2,800	(4)	48.0	
Village of New Athens	1.4	Urban	(6)	44.0	
Wood River	20.8	13,700	(1)	(3)	

NOTES:

- (1) Locks & Dam No. 26 Tailwater Gage, mi. 202.7, 0 = 395.48 NGVD, FS = 21.0
- (2) St. Louis (Market St.) Gage, mil. 179.6, 0 = 379.94 NGVD, FS = 30.0
- (3) Overtopping stage - 50.5 (upper area except 45.5 for tie-in at Alton)
50.5 (lower area).
- (4) Brickeys, MO Gage, mi. 136.0, 0 = 357.78 NGVD, FS = 26.0
- (5) Includes 16,425 feet of floodwall.
- (6) Red Bud Gage, mi. 18.6, 0 = 300.00 NGVD, FS = 374.00

DR 500-1-1
1 Apr 86

GENERAL LEVEE DATA

Kaskaskia River Area

<u>Levee District</u>	<u>Length of Protection</u>	<u>Acres Protected</u>	<u>Principal Gage</u>	<u>Over- Topping Stage</u>
Dively	3.2	2,000	(1)	32.0*
Germantown	1.9	875	(2)	32.0
Hanover	1.5	3,000	(2)	32.0
Heimann	1.2	1,200	(2)	33.0
Santa Fe	6.5	3,000	(2)	32.0
Vandalia	18.7	12,000	(1)	26.0 - 27.0

NOTES:

(1) Vandalia, IL Gage, mi. 146.1, 0 = 453.30 NGVD, FS = 18.0

(2) Carlyle Lake, IL Tailwater Gage, mi. 94.0, 0 = 0.00 NGVD

* Since new levee was constructed.

DR 500-1-1
CHANGE 1
15 Jun 87

GENERAL LEVEE DATA

Cape Girardeau Area

<u>Levee District</u>	<u>Length of Protection</u>	<u>Acres Protected</u>	<u>Principal Gage</u>	<u>Over- Topping Stage</u>
Bois Brule Levee	33.1	26,060	(1)	49.5
Clear Creek	21.0	18,000	(3)	52.0
Degognia & Fountain Bluff	19.4	36,200	(1)	49.5
East Cape	10.9	9,400	(3)	52.0
Grand Tower	17.2	14,800	(2)	51.0
Kaskaskia Island	14.8	9,460	(1)	41.3
Len Small (5)	17.0	23,000	(3)	42.0
Main St., & North Main St. (Cape Girardeau, MO (1.1 mi. floodwall))	0.4	Urban	(3)	54.2
Miller Pond	2.8	4,300	(3)	(4)
North Alexander	5.2	3,600	(3)	52.0
Preston	14.6	16,200	(3)	52.0
* Ste. Genevieve #2	10.0	7,000	(1)	36.0

NOTES:

- (1) Chester, IL Gage, mi. 109.5, 0 = 341.05 NGVD, FS = 27.0
- (2) Grand Tower, IL Gage, mi. 81.9, 0 = 321.93 NGVD, FS = 28.0
- (3) Cape Girardeau, MO Gage, 0 = 304.65 NGVD, FS = 32.0
- (4) Subject to flash floods only.
- (5) Len Small Levee and Drainage District (Open System).

DR 500-1-1
CHANGE 1
15 Jun 87

GENERAL LEVEE DATA

St. Louis Area

<u>Levee District</u>	<u>Length of Protection</u>	<u>Acres Protected</u>	<u>Principal Gage</u>	<u>Over- Topping Stage</u>
* City of St. Louis (See following page)				
Reach 3	7.0			
Reach 4	2.9			
Columbia Bottoms PL	8.0	4,000	(1)	(2)
Dardenne Creek PL				
East Flank	5.0	2,800-3,000	(3)	28.0*
West Flank	4.0	2,800-3,000	(3)	28.0*
Ehlmann PL	1.6	290	(3)	(2)
H. Machens PL	1.7	600	(4)	29.0-30.0
Hollrah PL	2.7	390	(3)	(2)
Kuhs PL	3.6	-	(1)	31.0
Neustadt-Farley PL	1.0	550	(1)	32.0
Schroeder-Daudt PL	2.0	-	(1)	32.0
Schulte-McNeary-				
Schlenke PL	-	100	(3)	(2)
Spencer Creek PL	1.4	-	(1)	(2)
St. Peters	4.5	1,000	(3)(4)	(2)
#West Alton	3.5	1,350	(1)	33.5-34.0
Boschert PL				
Brass-Brunstein PL				
Grunwaldt PL				
C. Machens PL				

*

NOTES:

- (1) Locks & Dam No. 26 Tailwater Gage, mi. 202.7, 0 = 395.48 NGVD, FS = 21.0
- (2) Subject to flash floods.
- (3) Lock & Dam No. 25 Tailwater Gage, mi. 241.2, 0 = 407.09 NGVD, FS = 26.0
- (4) Grafton, IL Gage, mi. 218.0, 0=403.79 NGVD, FS = 18.0
- # Protects City of West Alton, MO on the North Side.

* Lowest Overtopping Stage

Government owned levees consist of 4.5 miles, protects 300 acres approximately and overtopping stage is 31.0 to 32.0 feet on L&D No. 26 TW, gage.

DR 500-1-1

1 Apr 86

City of St. Louis Flood Protection

Project Reach 3 and Reach 4

Reach 3:

Start River Mile 187.2, Maline Creek-End River Mile 180.2, Carr Street
Length of Protection 7.0 miles
Floodwall - 18,870 linear ft.
Pumping Stations - 19
Closure Structures - 19
Drainage Area - 15,730 acres

Reach 4:

Start River Mile 179.2, Poplar Street-End River Mile 176.3, Chippewa St.
Length of Protection 2.9 miles
Floodwall - 16,292 linear ft.
Pumping Stations - 9
Closure Structures - 20
Drainage Area - 7,418 acres

Reach 3 and 4 contains 10.9 miles total (including 1 mile for the Arch area). It also contains 21,200 linear ft. of earthen levees.

Project Purpose: Reach 3 provides protection to 3,160 acres of commercial and heavily industrialized properties within the city of St. Louis. It also provides protection for 630 acres in Reach 4. The city of St. Louis is protected against a 200-year flood frequency.

DR 500-1-1
CHANGE 1
15 Jun 87

GENERAL LEVEE DATA

Meramec River Area

	<u>Levee District</u>	<u>Length of Protection</u>	<u>Acres Protected</u>	<u>Principal Gage</u>	<u>Over- Topping Stage</u>	
*	Pittsburgh Plate Glass Co. PL	1.2	120	(1)	36.0-37.0	*

NOTE:

(1) St. Louis (Market St.) Gage, mi. 179.6, 0 = 379.94 NGVD, FS=30.0

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APPENDIX K

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* Total	404	*